

A PICTORIAL SURVEY OF CURRENT PRACTICE, EQUIPMENT AND MATERIALS

Construction Methods

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MAY, 1944



THROUGH BURMA JUNGLE caravan of U.S. Army trucks traverses newly built section of Ledo Road, notched along steep hillside.

Acme Photo.

LEDO ROAD How Army Engineers, beset by incredible difficulties, are building new India-Burma-China supply routes.

Other Articles: Britain's Airdrome Construction . . . Post-War Municipal Construction . . . Ship Model Shop . . . Desert Air Base . . . Alaska Highway Bridge.



For Greater Bond ...
Specify INLAND

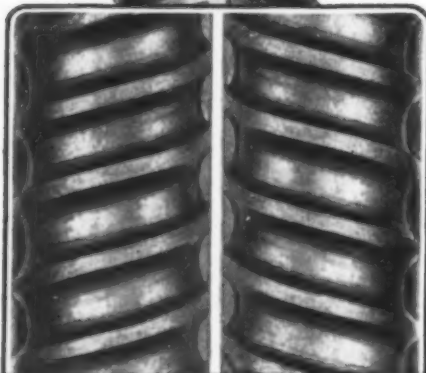
HI-BOND BARS

The newest advancement in reinforcing bars—designed especially for the greater bonding value necessary to take full advantage of modern high strength cement.

The new Inland Hi-Bond reinforcing bar greatly increases the effectiveness of reinforcing steel in concrete through improved load transfer between the two materials. This is accomplished by reversed double helical ribs which extend between longitudinal ribs.

This new design increases bond and mechanical grip, and assures more efficient transfer of stress at splices. Its resistance to slip tends to reduce deflection and width of cracks. Inland Hi-Bond bars bend exceptionally well due to close and even spacing of ribs. They are also easy to handle and wire securely in place. Inland Hi-Bond bars are made in nine standard areas.

Write for Bulletin!



This view shows both sides of the Inland Hi-Bond Bar, illustrating its reversed helical ribs.

INLAND STEEL COMPANY

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Sales Offices: Cincinnati • Detroit • Kansas City • Milwaukee • New York • St. Louis • St. Paul

Sheets • Bars • Plates • Floor Plate • Rails • Structural • Piling
Reinforcing Bars • Rail Steel Products

CURRENT JOBS ... and Who's Doing Them

BUILDINGS

Public—Navy contract for barracks at Seattle, Wash., was awarded to **Austin Co.**, of Cleveland, Ohio, for \$3,774,000. **United Engineers & Constructors, Inc.**, of Philadelphia, Pa., will build \$3,000,000 plant in Philadelphia. **J. A. Utley Co.**, of Royal Oak, Mich., has \$2,400,000 contract for plant additions at Muskegon. Contract for \$2,000,000 power unit at San Antonio, Tex., was awarded to **Gibbs & Hill**, of New York, N. Y. **Northwest Fabricators**, of Boise, Idaho, has contract to build 1,000 pre-fabricated dwelling units at Los Angeles, Calif., for \$1,940,445. **United Engineers & Constructors, Inc.**, of Philadelphia, has \$1,900,000 contract for reclaiming plant in Philadelphia. Long Beach, Calif., housing contract was awarded to **J. K. Thomas & Beyer Construction Co.**, of Los Angeles, for \$1,883,793. **Gravier & Harper**, of New Alexandria, La., has \$1,826,555 contract for housing in New Orleans. Contract for housing in Tampa, Fla., was awarded to **Paul Smith Construction Co.**, of Tampa, for \$1,569,846. Low bid of \$1,355,400 was submitted by **M. B. Kahn Construction Co.**, of Columbia, S. C., for housing at Warner Robins, Ga. **Kaiser Duceit Co.**, of Chicago, Ill., has \$1,000,000 contract for plant facilities at Muskegon, Mich.

Industrial—Contract for Freeport, Tex., plant was awarded to **Austin Co.** of Houston, for \$1,500,000. **Krahl Construction Co.**, of Chicago, Ill., will build \$2,000,000 plant in East Chicago, Ill. Contract for plant buildings in Cleveland, Ohio, was awarded to **George A. Rutherford Co.**, of Cleveland, for an estimated \$2,000,000.

Commercial—Housing contract in San Lorenzo, Calif., was awarded to **Bohannon & Chamberlain**, of San Mateo, Calif., for \$6,844,350. **Chas. Schulz**, of Cleveland, Ohio, has \$1,500,000 contract for apartment buildings in Cleveland.

HEAVY CONSTRUCTION

Irrigation project at Reynosa, Mexico, will be built by **S. J. Groves & Sons Co.**, of Minneapolis, Minn., and Reynosa, for \$4,000,000. Navy contract for rock jetty and dredging at Seal Beach, Calif., was awarded to **Guy F. Atkinson Co.**, of Long Beach, for \$3,444,400. Railway line between Eastern Junction and Bout de L'Isle, Que., will be built by **C. A. Pitts**, of Toronto, Ont., for \$2,800,000. **S. J. Groves**, of Ridgefield, N. J., submitted low bid of \$2,580,799 for excavation and asphalt paving at Parkersburg, W. Va., airport. Low bid of \$1,251,411 for improvements at Springfield, Mo., airfield was submitted by **Northwestern Engineering Co.**, of Rapid City, S. D., while **Peter Klewit Sons Co.**, of Omaha, Neb., submitted low bid of \$1,543,428 on another schedule of same project. Contract for floating drydock facilities at Vancouver, Wash., was awarded to **Kaiser Co.**, of Vancouver, for \$2,279,000. Air station buildings at El Centro, Calif., will be built by **M. N. Sundt**, of Tucson, Ariz., for \$2,118,000. **Virginia Engineering Co.**, of Newport News, Va., has \$1,764,200 contract for aviation facilities at Chincoteague, Va.

HIGHWAYS

Among recent highway contract awards are the following: District of Columbia and Maryland: \$366,211 to **C. L. Langenfelder & Sons**, of Rosedale, Md. Illinois: \$299,655 to **Chas. G. Gilmore Asphalt Products**, of Anna, Maryland: \$256,408 to **Baltimore Asphalt Block & Tile Co.**, of Baltimore, Ohio: \$284,858 to **Hinton & Smalley**, of Celina.

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Construction Methods

A Pictorial Survey of Current Practice, Equipment and Materials

JOHN ABBINK, Publisher

ROBERT K. TOMLIN, Editor

A. E. PAXTON, Manager

Editorial Staff: Vincent B. Smith, Paul Wooton (Washington)

N. A. Bowers (San Francisco) Nelle Fitzgerald

Patricia McGerr

MAY, 1944

A Cure for "Queuing Up"

• The British have a name for one of those inconveniences that war, of necessity, imposes upon civilians. It's "queuing up." We Americans mean the same thing when we speak of "standing in line." Under any name, however, the result is irksome—loss of time and temper waiting to get those things which, in peace time, are obtainable without delay. We wait impatiently in line for rationed meats and butter, for admission to popular Broadway shows, for advice on how to prepare our income tax returns, for railway tickets, for tables at restaurants and for the privilege of registering for a room at any hotel anywhere.

Because of the current paper shortage and other wartime restrictions affecting the publishing business, this problem of queuing up has become a real one for present and prospective subscribers to "Construction Methods" and other magazines. At this writing we have a waiting list of 1,500 orders for new subscriptions which we can not fill immediately without exceeding the monthly quota of copies which we may print. We shall, of course, add these new names to our subscriber list just as soon as it is possible to do so. In the meantime, we are asking the indulgence of our new friends who are in line to become regular readers.

Now, a word regarding our old friends—present subscribers to "Construction Methods." You receive from our Circulation Manager, well in advance, notice of the date of expiration of your subscription. In the present emergency you can be sure of receiving your copies without a break only by sending in your renewal PROMPTLY. Under present conditions, unfortunately, we must remove from our subscriber list the names of those who fail to meet their renewal deadline.

This brings us back to the problem of queuing up and a method of solving it. If a present subscriber's renewal order comes in late, his name must be placed at the tail end of the line of new orders. The way for present subscribers to avoid the delay and annoyance of queuing up on our waiting list, therefore, is to send in their renewal orders immediately on receipt of notice that their subscriptions are soon to expire. In this way only can they maintain their present preferred position at the head of the line and continue to receive their copies of "Construction Methods" without interruption.

R. K. TOMLIN, Editor.

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From

To

Signed

INVASION *and the* FINAL CHALLENGE

The idea that our national security some day would depend upon the successful invasion of continental Europe by our armed forces was inconceivable to the average American but a few short years ago. Yet, today our whole strength is assembled to that very action and for assuring a sound and permanent peace.

America became great without aggression . . . without tyranny. Our greatness has been achieved without destroying others . . . ours is a history of unprecedented industrial progress, of development of our own resources and reliance on our own efforts.

Aggression is foreign to American philosophy. Yet, today we find ourselves faced with the choice of destroying or being destroyed. Today we are confronted by the hard fact that the kind of peace which we all so fervently desire can be achieved only by crushing autocracy and by removing the causes of aggression.

We are now engaged in the accomplishment of the first objective. Since Pearl Harbor a complacent, peace-loving America—the largest of the "soft" and "decadent" democracies—has grown strong and tough. Out of the inherent virility of a free people we have moulded the mightiest force for invasion and attack that the world has ever seen.

We have reached our peak rates of war production. We are producing as much war equipment as all the rest of the world combined.

History will record our industrial mobilization as a phenomenal achievement.

The battle of production has been won!

The full might of our armed forces and those of our allies unleashed against the Axis war machine will bring eventual victory. Two and a half years of intensive preparation, backed by 168 years of growth as a free nation, has given us superiority over twenty years of painstaking preparation by the totalitarian and militaristic countries with their enslaved peoples.

Every American has contributed toward this powerful offensive. Our manufacturers and business leaders have exerted their fullest efforts. Our industries have mobilized their tremendous resources—tapped to the fullest degree their inventive and productive genius. The men and women in the factories, on the farms, and in the mills and mines have played a magnificent part in the tremendous production program. Citizens all are making their contribution to the armed victory that lies ahead.

We have demonstrated that a free people under a free enterprise economy can unite in a common purpose.

* * *

When the war is won, we shall be faced by our second objective . . . removing the causes of aggression. This is a social challenge. A challenge to those who would sacrifice our democratic way of life for personal gains or foreign ideologies.

The best insurance for the continuance of our democracy is a successful democracy. That means a dynamic and not a static democracy. All of us who want to preserve the ideals that have made America . . . and that includes all but a handful of extremists . . . must determine to find the policies and programs which will permit us to make the most of the abundance nature has provided for us.

To achieve this end we must recognize the fact that we are but a wheel in the machinery of world economy. A wheel that must drive or be driven. A wheel that must mesh smoothly with the many other wheels or be stripped of its cogs.

We are the only nation on earth free enough and strong enough to shape the mould of its own destiny. We can be hampered by nothing but our own confusion.

The mind and the heart of all America today brood over the shores of Britain and watch over the narrow waters that wash the beaches of the Continent. And the prayers of all America go with each of those who embark upon that epic passage.

Those of us at home who are producing the fighting tools and who are so earnestly concerned with the problems that will face a postwar America, should see now, even if we may never have seen it before, that all our plans will be worth just exactly what the men and women who make that passage are prepared, competent, and inspired by their leadership to make them worth.

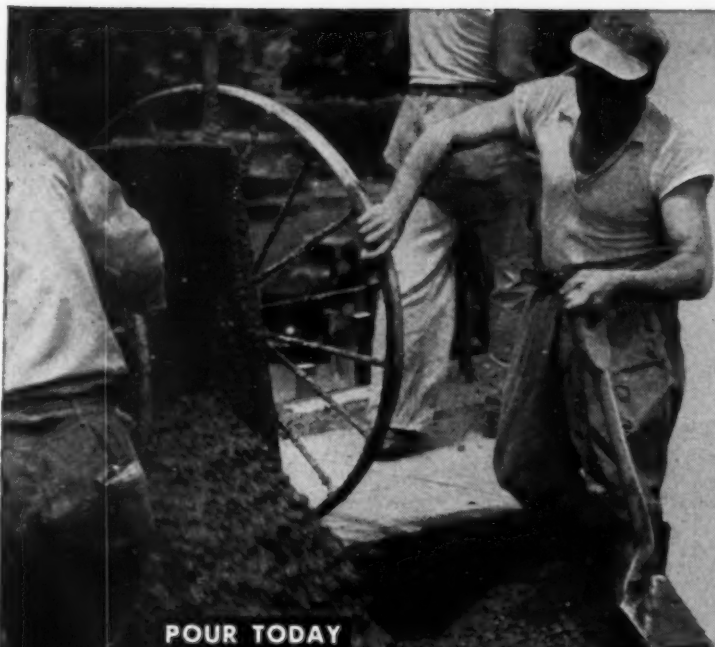
For those men and women are America!

They have gone out from rich homes and poor homes alike, from farms and factories, from schools and churches, from mines and ranches, from offices and studios, to take their places in the battle line. They are a cross-section of the America that is to be.

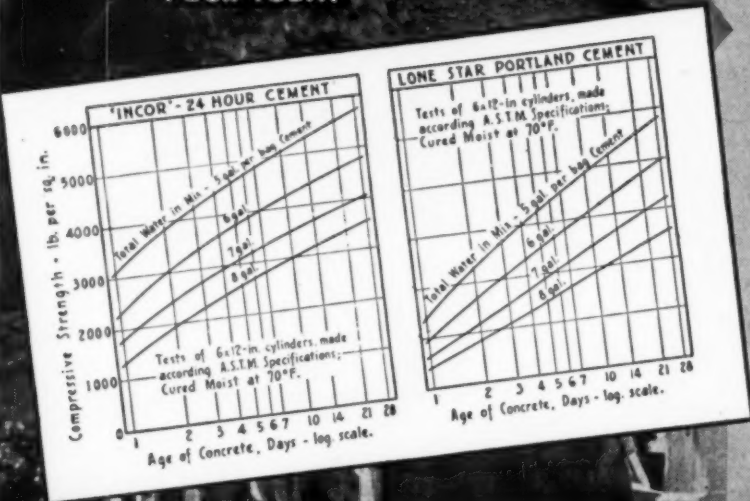
Whoever may draw the plans for that America, it is those men and women who will make the plans good. Invasion is their first step toward that end. May their work be speedily done, and may our plans be worthy of that work.



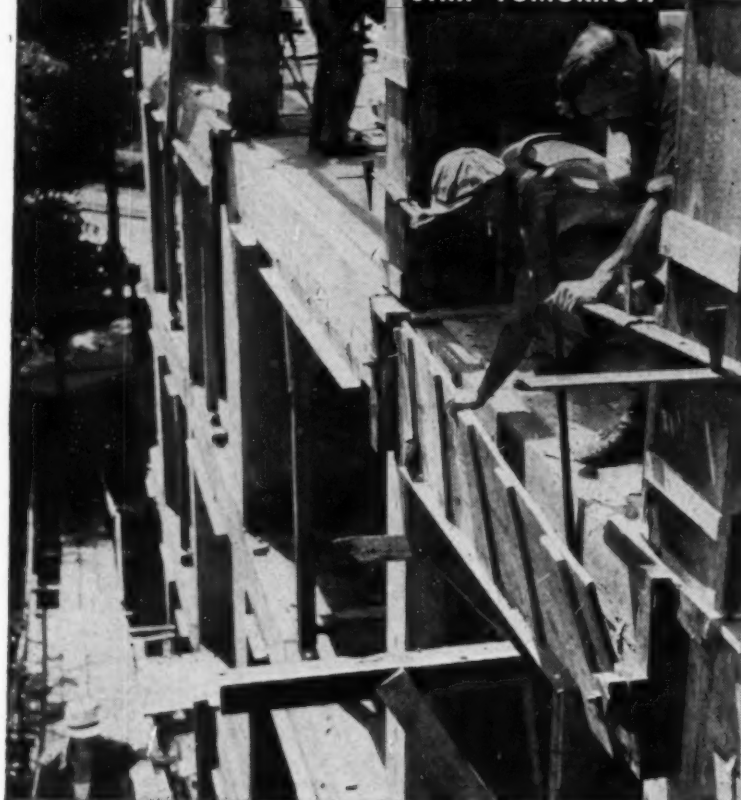
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STRIP TOMORROW



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Place 'Incor' concrete today . . . strip tomorrow. 24-hour service strength means—

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Saves both material and make-up

NO REPOSTING

Immediate access for mechanical trades

BETTER JOB CURING

Thoroughly cured concrete in 24 hours

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Dense, hard surfaces overnight

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Less time on job—reduced overhead

Estimate and build it with 'Incor'* 24-Hour Cement. Save money . . . get better concrete. Write for "Cutting Concrete Costs" book.

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That dynamic progress which says "This is America"! is nowhere so great as in the production of Raybestos friction materials for you.

★ Practically everything that is power-driven on land, sea or in the air requires brake linings and clutch facings for safe, smooth control. And the amazing advancements in the speed, power and performance of this equipment have called for like advancements in the production of friction materials. ★ Raybestos has won leadership in this basic industry. Raybestos advanced friction materials anticipate the ever-changing, ever-challenging requirements of American progress—in their design, their development and their use.

THE RAYBESTOS DIVISION of Raybestos-Manhattan, Inc., BRIDGEPORT, CONN.



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INVEST IN AMERICA
BUY BONDS ★

Manufacturing the most complete line of highest quality metallic and non-metallic brake linings and clutch facings for every type of equipment, war and civilian. Also fan belts and hose.



Dependable EUCLIDS

COST LESS TO OWN



On scores of big earth and rock moving jobs, and in industrial operations too, Rear-Dump and Bottom-Dump EUCLIDS are moving more yards and tons per hour at consistently lower cost. Carrying pay loads of 15 to 30 tons at speeds up to 33 m.p.h., EUCLIDS cut down the round trip time from the loading unit to dump and carry more pay loads per hour.

Designed and built throughout for the hard service of off-the-highway hauling, EUCLIDS actually cost less to own than ordinary hauling equipment. Lower operating and maintenance

cost, plus dependable trouble-free operation, has made Euclid the favorite equipment of contractors and industrial users for hauling all kinds of heavy excavation and materials.

If you need new equipment for a current job or are planning for your peace time requirements, be sure to consult your Euclid distributor or write us for descriptive literature.

The EUCLID ROAD MACHINERY Co.
Cleveland 17, Ohio



EUCLID

**SELF-POWERED
HAULING EQUIPMENT**

For EARTH · ROCK · COAL · ORE

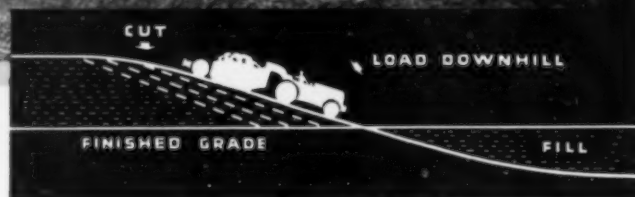




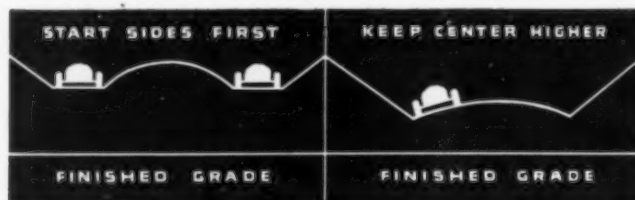
*Here's the Cheapest,
Best Way*
**TO MAKE A
STRAIGHT CUT**



When you're making a straight cut through a hill to flatten a grade — why go to the extra expense of separate digging, hauling and finishing units, when you can do the complete job faster, cheaper, better with LaPlant-Choate "Carrimor" scrapers? Dig...haul...dump...spread! Your "Carrimors" will do everything, even to back-sloping and rough finishing the final cut. And tomorrow's "Carrimors" will do it faster and cheaper than ever! Better see your LaPlant-Choate "Caterpillar" distributor real soon. LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa.



Wherever possible load your scrapers on down hill pulls. This utilizes the weight of your tractor and scraper to heap loads quicker with less tractor power. This often enables you to load your "Carrimors" without pushers in cases where pushers would be required on level grades.



In making a straight cut, carry the center higher than the sides. This helps to carry the slopes, provides better drainage in case of rain,

and makes it easier to heap scraper loads. It also leaves the cross section of the road approximately as it will be when finished.

**Are We Going To Be As Unprepared For
Peace As We Were For War?**

"Too little and too late" almost lost this war in its early stages — and it can more easily lose the peace, unless we start planning now to provide decent jobs for returning service men. Experience proves that the most practical solution is an adequate construction program using "the contract method". But it's going to require an unprecedented number of worthy projects — planned, blueprinted and ready to let when the need arises. And remember, it's better to be ready with "too much, too soon," than — "too little, too late."



LAPLANT-CHOATE
Earthmoving and Land Clearing Equipment

**For You When This War is Over . . . COMPRESSORS
BUILT TO THE STANDARDS OF AIRCRAFT MOTORS**



Under the name "AIR PLUS", The Jaeger Machine Company is today building the finest 2-stage, air-cooled compressor mechanism yet developed to supply air up to 500 cu. ft.

As in aircraft motors, the moving parts are micro-honed and lapped, resulting in lifetime characteristics of high efficiency, smooth operation and ample reserve power for extreme altitude work.

The Jaeger-designed, air-activated "Tough Swedish Twin" Valves, which insure air plus coolness, are an advance in compressor design. Accessibility has been so well provided that it is a matter of minutes to remove and replace any compressor part.

All Jaeger equipment produced today is vitally needed

for war. We ask you to be patient. Our experience and greatly improved facilities will be ready to help you win your battles tomorrow.

THE JAEGER MACHINE CO., COLUMBUS 16, OHIO

JAEGER
Engineered **EQUIPMENT**

"AIR-PLUS" 2-STAGE AIR-COOLED COMPRESSORS 60 TO 500 FT. — "FLEET-FOOT" CRANE-LOADERS — "SURE PRIME" CENTRIFUGAL PUMPS — "SPEEDLINE" BUILDING MIXERS — "DUAL-MIX" TRUCK MIXERS — "JAEGER" HOISTING ENGINES AND TOWERS — "JAEGER-LAKE-WOOD" PAVING EQUIPMENT

Then he said to himself

"THIS WAR HOLDS UNPREDICTABLE DEVELOPMENTS"



FOR once Premier Mussolini was right when, just a year ago, he warned the Fascist Directorate that "This war still holds unpredictable developments, which will not all be on the political plane."

But there was enough on the "political plane" to slam his chin back in his collar, and if one wishes to read a moral into his statement, it could well be:

You always lead with your chin when you team up with the wrong working partner.

It is then you get unpredictable results of a **DESTRUCTIVE** nature.

"Unpredictable Developments" he says

Look, Benito (*wherever you're hiding*), how men achieve predictable developments of a CONSTRUCTIVE nature when through recourse to Arc Welding they team up with a CONSTRUCTIVE partner:



A builder changed a factory design from conventional construction to welded rigid frame.

PREDICTABLE DEVELOPMENTS: Saving of 30% in weight of steel. Greater strength. Improved appearance (no trusses).

CONSTRUCTIVE RESULTS: The above advantages plus a reduction in fabrication cost from \$15 to \$8 per ton.

Studies in Structural Arc Welding will be sent you free on request.

THE LINCOLN ELECTRIC COMPANY • CLEVELAND 1, OHIO

America's greatest natural **recourse**
ARC WELDING

MODERN MATERIAL MOVERS...

to save you time and money!

ATHEY MOBILoader

Left, an Athey Mobiloader loads from stockpile into truck in Alabama. Force-Feed Loader at right picks up and loads material on road widening job in Maryland.

ATHEY FORCE-FEED LOADER

Manpower is today's big problem. Men are scarce and time-saving equipment comes more and more into popularity. Athey loading equipment is stepping up loading production with less manpower, thus, it's filling a vital wartime need.

The Athey Mobiloader cuts minutes from loading time because it backs up and unloads material overhead, saves tractor turning. Keeps costs low, too, through the economy of the "Caterpillar" Diesel Tractor. It handles the widest variety of materials.

The self-propelled Athey Force-Feed Loader is another man and time saver. It's a companion tool for the Motor Grader. Loads surplus materials cheaper, faster and cleaner than ever before. Works on highway maintenance and construction.

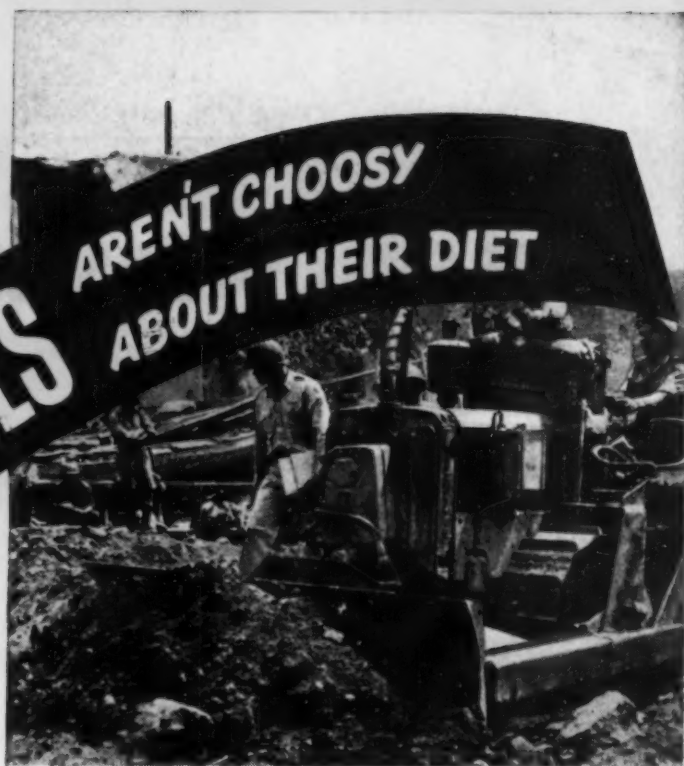
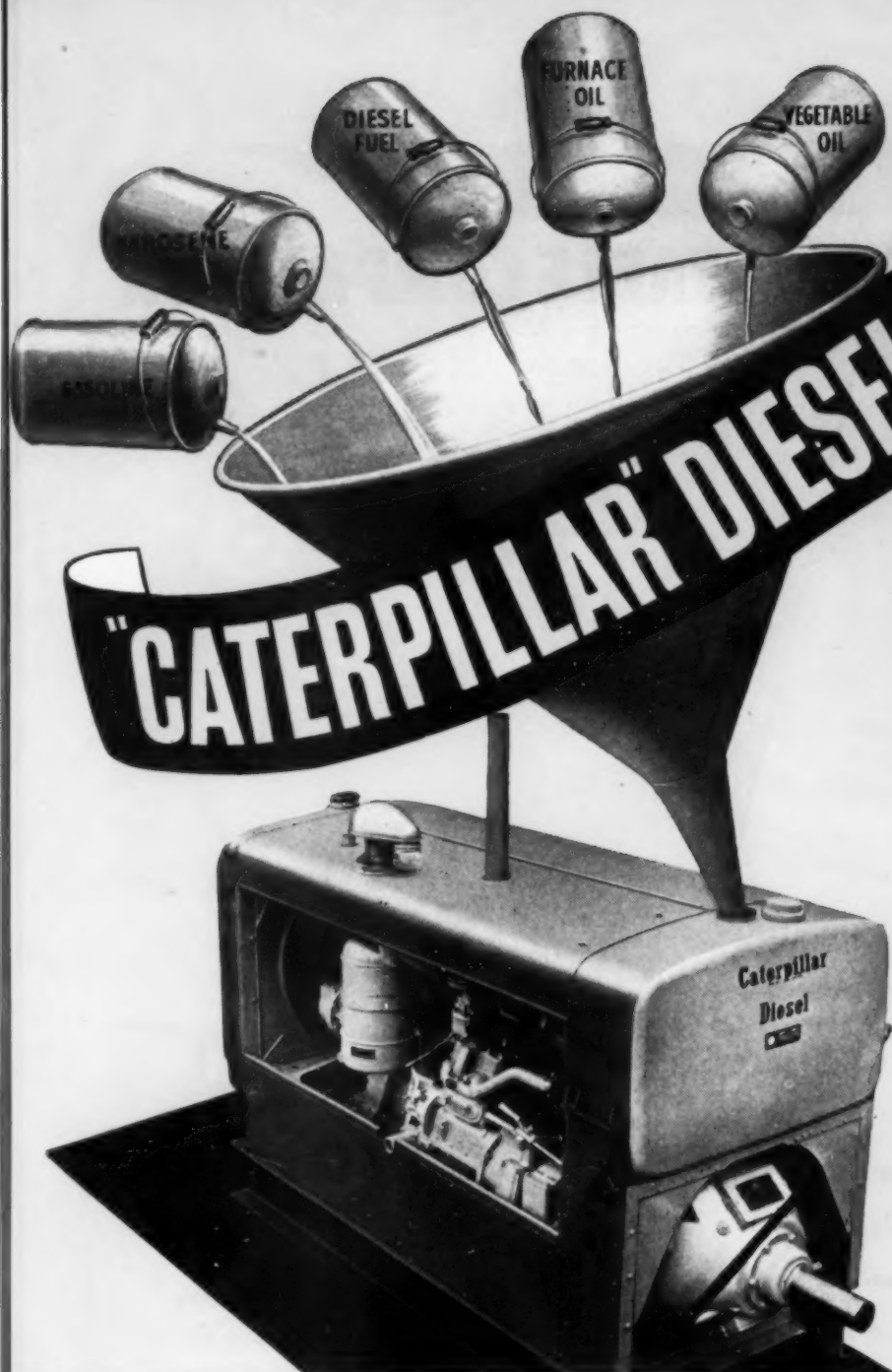
Why not check further into these modern loading machines? Write your Athey-"Caterpillar" Dealer, or direct to Athey Truss Wheel Co., 5631 W. 65th Street, Chicago, 38, Ill.



Athey



for Hauling and Loading Equipment



A "Caterpillar" Diesel Engine has a digestion like an Army mule. It's ready to do a cheerful day's work on any kind of fuel you feed it—and mighty little of that!

The "Caterpillar" fuel injection system is the only one of its kind in the world. Designed and built by "Caterpillar," it's extraordinarily simple, yet machined with watch-like precision.

That's why you don't have to worry about fuel. A "Caterpillar" Diesel will burn anything from cleaned crude oil to gasoline without adjustment.

The "Caterpillar" Diesel fuel system is completely protected from dust and grit, and it needs no operating adjustments whatever. When service is necessary, your "Caterpillar" dealer has factory-

trained men, parts and special tools to make servicing quick, easy and inexpensive.

Simplicity, power and long life explain why "Caterpillar" Diesel equipment is the overwhelming choice of men who use heavy-duty machines.

As long as the war lasts, the bulk of new "Caterpillar" production goes to the armed forces, and the remainder is allocated by WPB among war-essential users. Meanwhile, "Caterpillar" dealers everywhere are keeping older machines in shape to carry the load at home. But a day will come when our hugely increased output can be swung back to peacetime work. And those new "Caterpillar" Diesels will be worth waiting for!

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

THE "FIGHTING FOUR"

INSPECT. Look your equipment over frequently. For expert "internal" inspection of operating parts or functions, call in a trained "Caterpillar" service man. Read your Operator's Instruction Book.

LUBRICATE. Use the right oil at the right time in the right place and in the right quantity. Keep the oil clean—change before it becomes dirty and deteriorated. Follow the Operator's Instruction Book.

ADJUST. Tighten all bolts. Keep fan belt and tracks at proper tension. Read the Operator's Instruction Book. For fuel injection valves and other precision adjustments, let your experienced service-dealer do the work. He'll do it well.

REPLACE. Have your service-dealer replace or repair worn bearings, track rollers, pins and bushings, sprockets, cylinder liners, clutch linings. His service helps restore power and extend equipment life. Saves critical materials, too.

CATERPILLAR DIESEL



TO WIN THE WAR: WORK—FIGHT—BUY U. S. WAR BONDS!

BE SURE YOUR NEXT PORTABLE COMPRESSOR

has all of these features

1. Multi-speed regulator which automatically adjusts the engine speed to the use of air and practically eliminates wasteful idling... reduces average working speed of compressor and engine, resulting in more efficient operation and longer life ...and with pressure characteristics that will get more work out of air tools. (On MOBIL-AIR compressors, this regulator is called the "Drill-More" regulator.)
2. Convertible engine... quickly changed from operation on one fuel to another (gasoline, oil, or natural gas) by substitution of external fuel accessories only.
3. If a gasoline engine, the most economical type... which will make substantial savings even with regular gasoline and at all loads. Or if an oil engine, a low-compression type that is easily started and easily maintained.
4. A modern two-stage air-cooled compressor with Channel Valves.
5. Unified assembly of compressor and engine ... maintaining permanent alignment.
6. Light weight... but strong, sturdy, and tough.
7. Reasonable over-all dimensions.
8. Sturdy, easily operated and easily maintained clutch.
9. Electric cranking (for oil as well as gasoline engine) with commercial 6- or 12-volt equipment.
10. All operating controls and gauges centrally located.
11. Stream-lined design... for strength and durability.
12. Low, easily filled fuel tank.
13. Spring mounting and automotive steering if 210 cfm size or larger, 2-wheel trailer for all smaller sizes.
14. A fine, durable finish.
15. Proven design and performance.



These features are built into MOBIL-AIR compressors... 5 sizes 105 to 500 cfm. These are the portables that decreased gasoline consumption as much as 40% compared to best previous models... and that established new records of endurance, reliability and low maintenance. Insist that your next portable is a MOBIL-AIR.



Ingersoll-Rand

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6 MILLION GALLONS



and No Uneven Application

F. L. THOMAS & CO.
4132 MEADOWBROOK
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FORT WORTH, TEXAS

March, 30, 1944

H.H. White, Sales Manager,
Standard Steel Works,
North Kansas City, Mo.,

Dear Mr. White;

After pouring between 5 and 6 million gallons of bituminous material through our 1250 gallon trailer mounted Model 400, we are sending it in to you this week for its first overhaul.

We are in a hurry for it, however, if time permits; please clean it up and repaint it.

Incidentally for your information, we have sprayed OA 250 asphalt in every temperature from 28° up and have had no difficulty with the bar freezing or time lost pre-heating bar before starting to shoot.

We have applied all types of materials from the lightest to the heaviest in widths from 6' to 28' and have never experienced any uneven application.

Without a doubt, it is one of the best units that we have ever operated and ever have seen operate and are looking forward to the day that we can buy another.

Yours very truly,
F. L. Thomas
F. L. Thomas

In three years operation, pouring from the heaviest to the lightest oils, in temperatures from 28° and up, spray widths from 6' to 28', F. L. Thomas flatly states that at "no time did he ever experience uneven distribution throughout the full length of the full circulating spray bar." Using a 1250 gallon Model 400, this remarkable record was performed in every section of Texas on all types of Bituminous work.

This Model 400, semi-trailer mounted, has a 28' full circulating spray bar, 375 GPM pump, Ford V8 motor, 2 speed transmission and right angle drive.

Write today for catalog RS 4142.

OTHER PRODUCTS

Asphalt Distributors • Tar Kettles • Maintenance Distributors • Burners • Street Flushers • Spray Units • Supply Tanks • Surface Heaters • Shoulder Rollers

SALES OFFICES IN PRINCIPAL CITIES

Standard Steel Works

NORTH KANSAS CITY, MO., U.S.A.

IT WILL
PAY YOU
TO

COMPARE **TOURNAPULLS** WITH ORDINARY SPEED



To More Profitable
Earthmoving

Postwar construction plans for rebuilding, relocating and widening highways and for lengthening airports definitely show the trend is to longer hauls. To profitably handle these longer-haul jobs of tomorrow, you'll need equipment that can move big yardages fast. Tournapulls are the answer. Compare them with ordinary tractors and tractor-drawn scrapers for:

SPEED

Tractor speeds range from 1.5 to 7 m.p.h. Tournapulls operate from 2.6 to 14.3 m.p.h. and average 2 to 3 times faster than the fastest tractors. Chart here shows what this greater speed can mean to you in extra yardage.

YARDAGE

ONE-WAY HAUL DISTANCE—CU. YDS. PER HOUR *

Tractor-drawn Scrapers:	400'	600'	800'	1,000'	2,000'	3,000'	4,000'	5,000'
30-Yd. Capacity	—	—	175	153	97	71	56	46
23-Yd. Capacity	—	187	162	142	89	65	51	—
18-Yd. Capacity	196	163	139	122	74	—	—	—
15-Yd. Capacity	170	142	121	106	65	—	—	—
With 15-Yd. Super C Tournapull you get:	200	180	168	156	116	91	76	65

*All units pusher loaded on level.

Example: On a 2,000-foot, one-way haul, the Super C Tournapull will move, on an average, 27 cu. yds. more per hour than a 23-yard scraper.

On 10,000-hour working life, that's 270,000 cu. yds. Figure the gain to you at your own usual bid price!

TOURNAPULLS

RUBBER-TIRED POWER FOR FASTER EARTHMOVING

TOURNA PULLS

IN TRACTORS ON THESE 4 POINTS

YARDAGE WEIGHT POWER

WEIGHT

Mover and ment	Super C Tournapull & 15-Yd. Carryall	Tractor & 15-Yd. Scraper Approx.	Tractor & 18-Yd. Scraper Approx.	Tractor & 23-Yd. Scraper Approx.	Tractor & 30-Yd. Scraper Approx.
of ned Units	31,000#	53,500#	57,575#	65,575#	70,875#

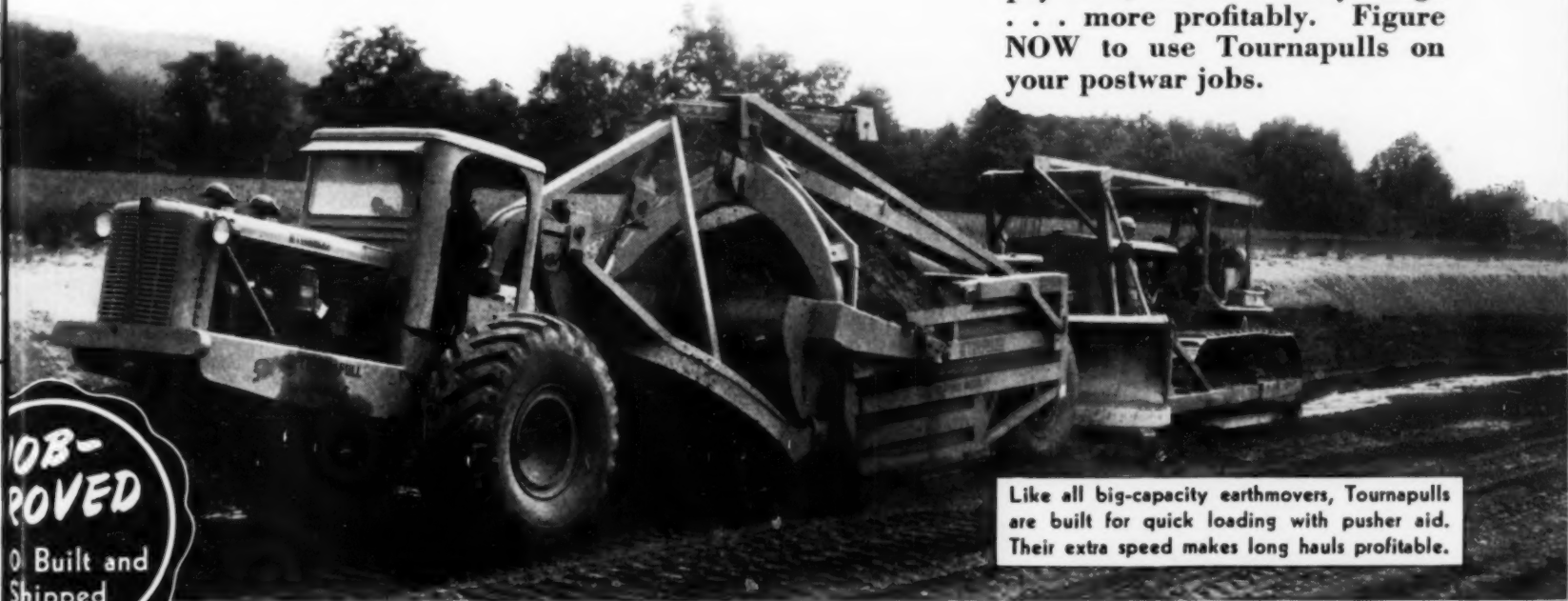
On a 30-yard scraper, this difference in weight is the equivalent of 14.5 pay yards. Can you afford to lug that

much dead weight back and forth over a 10,000-hour working life?

POWER

What's more, the Tournapull has more power for its working weight—150 d. b. h. p. for 31,000 lbs.—which gives you higher average speeds and quicker getaway.

Why use slow-moving, overweight equipment, when you can have faster-moving, job-proved Tournapulls? You'll pay less, move more yardage . . . more profitably. Figure NOW to use Tournapulls on your postwar jobs.



**JOB-
PROVED**

Built and
Shipped

Like all big-capacity earthmovers, Tournapulls are built for quick loading with pusher aid. Their extra speed makes long hauls profitable.

LETOURNEAU

PEORIA, ILLINOIS • STOCKTON, CALIFORNIA

Manufacturers of TOURNA PULLS*, DOZERS, CARRYALL*
SCRAPERS, POWER CONTROL UNITS, ROOTERS*,
SHEEP'S FOOT ROLLERS, TOURNAROPES*, TOURNA-
TRAILERS*, TOURNAWELDS*, TOURNACRANES*.

*Trade Mark Reg. U. S. Pat. off.

COMPRESSED AIR *where you want it...even when the going is tough!*

No matter where you need compressed air in construction work—Schramm's hard hitting, versatile Compressors get right next to the job and furnish all the air you want.

Note the tough job Schramm is easily handling in this photograph of demolition work. The fact that Schramm is lightweight—compact—without losing any of its ruggedness—enables

you to move Schramm anywhere.

These features are exclusive: 100% water cooled... Built as a unit... Mechanical intake valves... Push button starter... Larger discharge valves which cover almost the entire area of the piston heads.

Specify Schramm. For further details write for Catalog 42-PA.



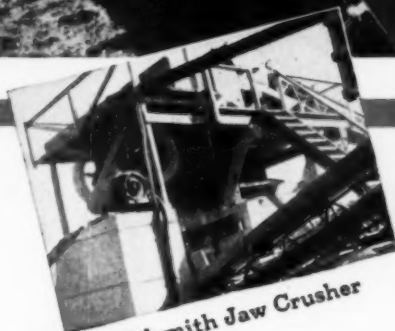
SCHRAMM INC.

THE COMPRESSOR PEOPLE
WEST CHESTER
PENNSYLVANIA

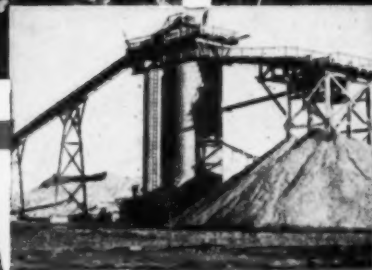
TELSMITH

GRAVEL PLANT

serving urgent war jobs



TelSmith Jaw Crusher



TelSmith Sand Tanks



TelSmith Gyrasphere



★ Urgent war projects near Pawtucket, R. I. demand large amounts of concrete aggregate. Owned by McHale Bros., the recently built TelSmith-equipped River Sand & Gravel Co. plant at Seekonk, Mass., turns out 180 tons per hour producing minus 1½" sand and gravel, 40% of total product is sand.

A 1½ cu. yd. shovel and two end dump trucks feed raw bank run gravel into an 8 cu. yd. hopper having a railroad rail grizzly that rejects the few over-size boulders. A 30" x 5'6" TelSmith Reciprocating Plate Feeder feeds material out of hopper and over a No. 450 TelSmith Rotary Grizzly with ¾" spaces. Plus ¾" goes to an 18 x 30 TelSmith Roller Bearing Jaw Crusher. A 30" x 73' belt conveyor takes minus ¾" direct from the grizzly, and from the jaw crusher, to a 4' x 10' TelSmith Single Deck Pulsator.

Plus 1½" from this scalping screen goes into a No. 36 TelSmith Gyrasphere Crusher; and when crushed returns to the 30" primary conveyor via an 18" x 48'6" conveyor.

Minus 1½" from the scalping screen goes via a 24" x 186'6" finished product conveyor to a 5' x 12' TelSmith 2-Deck Pulsator for washing and sizing. Sand is flumed to two No. 8 TelSmith Sand Tanks on a tower independent of main plant. The two sizes of gravel are deposited in two 20' diam. concrete-block silo bins, fitted with bin gates for loading into trucks.

Why do so many operators with war construction jobs depend on TelSmith? Because TelSmith equipment can be pushed to *top speed* and *will produce*. TelSmith Engineers' plant planning is sound. TelSmith Service is fast. *Get Bulletin G-10.* G-10R

SMITH ENGINEERING WORKS, 510 E. CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

Cable Addresses: Sengworks, Milwaukee—Concrete, London

51 East 42nd St.
New York 17, N.Y.
Strandis M. & S. Co.
Louisville 8, Ky.

211 W. Wacker Drive
Chicago 6, Ill.
Charleston Tractor & Eqt. Corp.
Charleston 22, W. Va.

713 Commercial Trust Bldg.
Philadelphia 2, Pa.
Roanoke Trac. & Eqt. Co.
Roanoke 7, Va.

19-21 Charles St.
Cambridge 41, Mass.
North Carolina Eqt. Co.
Raleigh & Charlotte, N. C.

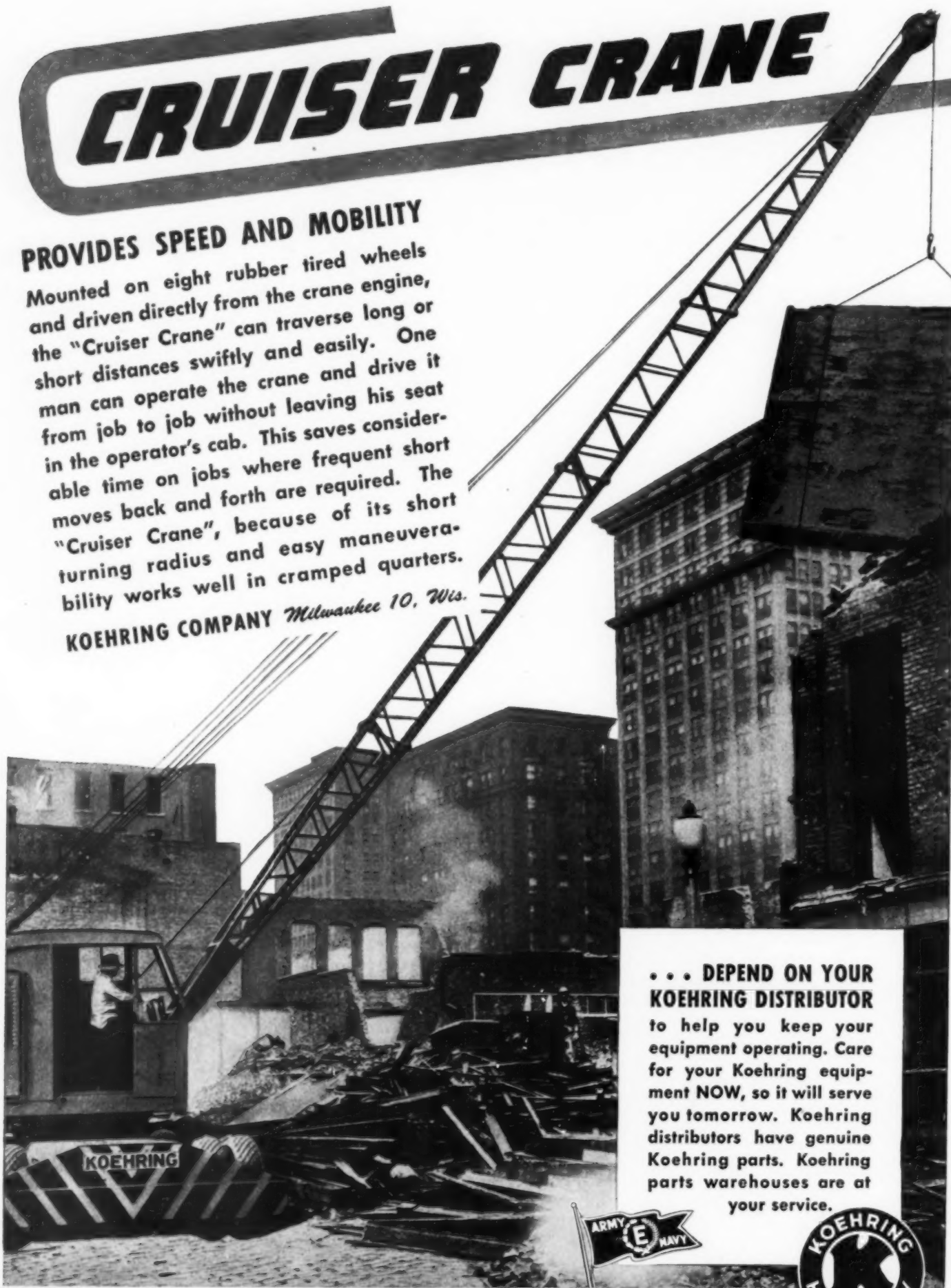
G. F. Seeley & Co.
Toronto, Ont.
Mines Eng. & Eqt. Co.
San Francisco 4—Los Angeles 14
Wilson-Weesner-Wilkinson Co.
Knoxville 8 and Nashville 6, Tenn.

CRUISER CRANE

PROVIDES SPEED AND MOBILITY

Mounted on eight rubber tired wheels and driven directly from the crane engine, the "Cruiser Crane" can traverse long or short distances swiftly and easily. One man can operate the crane and drive it from job to job without leaving his seat in the operator's cab. This saves considerable time on jobs where frequent short moves back and forth are required. The "Cruiser Crane", because of its short turning radius and easy maneuverability works well in cramped quarters.

KOEHRING COMPANY *Milwaukee 10, Wis.*



... DEPEND ON YOUR KOEHRING DISTRIBUTOR

to help you keep your equipment operating. Care for your Koehring equipment NOW, so it will serve you tomorrow. Koehring distributors have genuine Koehring parts. Koehring parts warehouses are at your service.

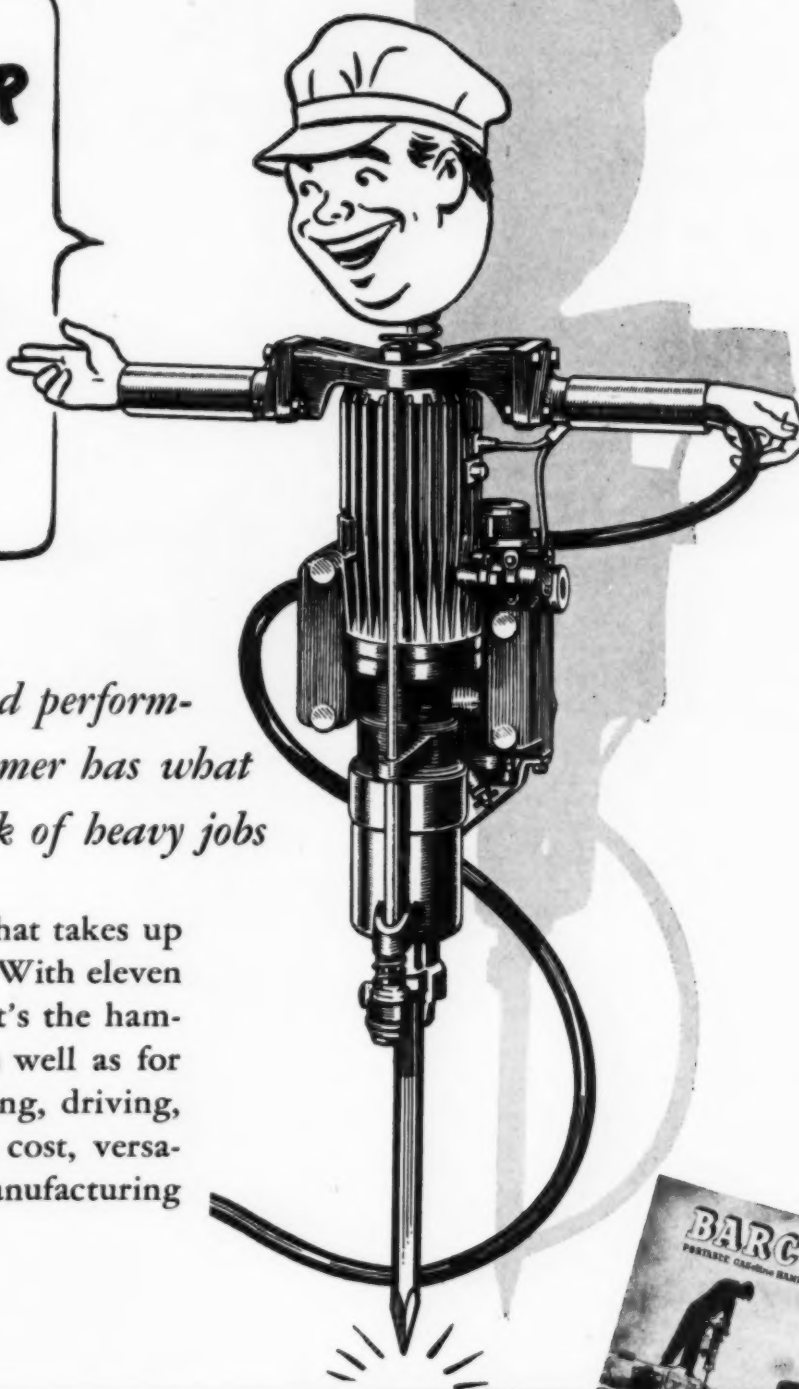


HEAVY-DUTY CONSTRUCTION EQUIPMENT

**"THE TOUGHER
THE JOB,
THE BETTER
I LIKE IT!"**

Rugged in construction and performance, the Barco Gas Hammer has what it takes to make light work of heavy jobs

It's a self-contained unit that takes up little room in your truck. With eleven special tool attachments, it's the hammer for that special job as well as for regulation breaking, drilling, driving, tamping or digging. Low cost, versatile, and efficient. Barco Manufacturing Company, Not Inc.



BARCO

PORTABLE GASOLINE HAMMERS

BARCO MANUFACTURING CO., NOT INC.
1814 Winnemac Ave., Chicago 40, Ill.

Gentlemen:

Without obligation on my part please send me a copy of the
BARCO HAMMER BOOKLET.

Name

Street

City State



BRIXMENT Mortar Has Better Water-Retention

● Water-retaining capacity is the ability of a mortar to retain its moisture, and hence its plasticity, when spread out on porous brick.

High water-retaining capacity is of *extreme importance* in mortar. If the mortar does not have high water-retaining capacity, it is too quickly sucked dry by the brick; the mortar stiffens too soon, the brick cannot be properly bedded, and a good bond cannot be obtained.

Brixment mortar has extremely high water-retaining capacity. It strongly resists the sucking action of the brick. Brixment mortar therefore stays smooth and plastic longer, when spread out on the wall. *This permits a more thorough bedding of the brick, and a more complete contact between the brick and the mortar.* The result is a better bond, and hence a stronger and more *water-tight wall*.



Slap a small amount of Brixment mortar, and an equal amount of 50-50 lime and cement mortar, on a brick.



Wait a minute, then feel each mortar. You will find that the Brixment mortar stays plastic far longer than the other mortar. This proves greater water-retaining capacity.

LOUISVILLE CEMENT COMPANY, Incorporated
General Offices: Louisville 2, Kentucky
Cement Manufacturers Since 1830

still **PUSHIN'**



SIGNAL
CORPS
PHOTO

They're going big over there as they did over here! The same 2-cycle Diesel tractors that helped rush through the huge home front construction program the last few years are showing they still have plenty of service left . . . are now handling and licking even more difficult work for the Armed Forces overseas.



After tough day and night shifts on the big ordnance jobs here, they were put in tip-top operating condition in a hurry and shipped to distant areas of activity. Much of the overhauling was handled by Allis-Chalmers dealers whose skill, proper tools and genuine parts made A-1 repairs a certainty.

Now is the time to plan your future dirt-moving methods. Now is the time to investigate 2-cycle Diesel power . . . see what it will do for you! Why not talk it over with your Allis-Chalmers dealer! Write for literature.

↓ During the days of action here, 2-cycle Diesel tractors in great numbers helped lay the groundwork for the Arsenal of Democracy.

↑ Now in active theaters of the war, the same 2-cycle Diesel tractors help prepare the bases and airfields for use against the enemy.



ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.
2-CYCLE THE MODERN DIESEL POWER

**St. Louis Contractor
Finds LINK-BELT SPEEDER
"Tops" for Fast, Trouble-Free Digging
in Missouri's
"Gumbo" Mud!**



**A SURE SIGN
OF AN EFFICIENT OPERATION**

LINK-BELT SPEEDER

Builders of the Most Complete Line of
SHOVELS-CRANES-DAGLINES
LINK-BELT SPEEDER CORPORATION, 301 W. PERSHING ROAD, CHICAGO-9, ILL.
(A DIVISION OF LINK-BELT COMPANY)

HERE'S A PARTIAL LIST OF SUBJECTS—

ON OPERATION:

Proper Handling of
Operating Controls
Unloading the Paver
Preparing the Paver for Job
Adjustments
The Hydraulic Control
System
Cold Weather Operation
Storing the Paver
Lubrication

ON MAINTENANCE:

General Maintenance
Repacking Transfer
Chute Bearings
The Water System
Cleaning Valves
Replacing Parts
Servicing Hydraulic Control
System
Replacing Bushings and
Bearings
Replacing Cables
Proper Reeving
Cleaning Clutch and
Brake Bands

ON PARTS:

Complete listing of all parts
by assemblies
Clear, understandable
illustrations

*Proper Maintenance
paves the way to
Bigger Profits*



TO HELP all Ransome 34E Dual Drum Paver owners take better care of their machines, get longer life, and best service, we offer this comprehensive 100-page Operation and Maintenance Manual. A few of the many subjects covered are listed at the left.

If you own or contemplate owning a Ransome Paver, you are invited to write for your copy of this helpful time-and-money-saving book.

CONSTRUCTION EQUIPMENT DIVISION

Ransome
MACHINERY COMPANY
DUNELLEN, NEW JERSEY

SUBSIDIARY OF WORTHINGTON PUMP AND MACHINERY CORPORATION

QUICK QUIZ FOR CONSTRUCTION MEN

You May Find the Answer to Your \$1,000 Question!



Q Is the wear and tear on track rollers on "Cats" out of proportion to use?

A Here's an outfit that answers "No!". Working with Alemite Lubrication Specialists, they adopted an "on the job" method of pressure lubrication. An 18 month check showed that track roller wear had been reduced 32% over hand type greasing. That's very important these days when replacement parts are tough to get. Chances are this Alemite method could show you some amazing results, too.



Q Are you throwing lubricants away or risking contamination?

A The experience of this organization may be your answer. The Alemite Lubrication Specialist recommended a simple "barrel to barrel" method of power lubrication that greased machines right on the job. The end result was a 19% reduction in consumption of oil and grease. Every bearing and gear got clean, uncontaminated lubricants. Would a 19% saving in lubricants mean anything to you?



Q Can your grease "take it" come hell or high water?

A "Yes," if it's Alemite. On hundreds of jobs Alemite's amazingly tough, versatile lubricants are fighting friction in ground air temperatures ranging from hottest tropical to arctic cold. Alemite #33, an exclusive Alemite product, is extremely water repellent, endures tremendous loads safely, can't clog grease guns or bearing lubricant grooves. Have you checked up on your lubricants lately?

Yes! "Lubri-chaos" Can Cost You Money, Machines and Production!

"Lubri-chaos" is an affliction found in the best managed construction setups. Today, with more inexperienced help on the job, "impossible" schedules to meet, and far-flung projects to serve, "Lubri-chaos" has become a nightmare of management.

Alemite, as the pioneer in pressure lubrication, has crusaded for years to remedy this costly evil. Today, the modern Alemite method of handling and application of lubricants is recognized as the answer to "Lubri-chaos" and is proving its worth wherever machines are at work.

Tomorrow, when post-war competition makes new demands on the construction industry, the Alemite method will play an important role. That is why operators with an eye to post-war business are getting together with Alemite Lubrication Specialists to gain the competitive advantage of the world's most advanced lubricating methods. Alemite, 1840 Diversey Parkway, Chicago 14, Ill., or Belleville, Ontario.



WANTED Tough Job by Man with "MML" Degree!



This man, an Alemite Lubrication Specialist, is a "Master of Modern Lubrication." His technical training, skill and experience equip him to come on your job and consult with you about applying the most modern lubricating methods. He has added more productive time to machines, saved lubricants and man-power. He has installed safer, surer, more accurate lubricating methods.

He's ready to go to work for you now, backed by the world's most experienced organization in the handling and application of lubricants. Call him. Or, if you prefer, write, wire or phone Alemite for his address.

ALEMITE

First in Modern Lubrication

LUBRICATION • CONSULTATION • ENGINEERING • EQUIPMENT • MAINTENANCE

INVASION



WHEN THE SIGNAL COMES for invasion, the United States Armed Forces, according to present estimates, will have approximately 11,000,000 men ready for combat.

These millions of Americans, combined with the forces of the United Nations will represent the largest army in the world of combat soldiers and one that will assure Victory at the time of invasion.

GAR WOOD INDUSTRIES, INC.
DETROIT 17, MICHIGAN



BUY MORE WAR BONDS
TO INSURE A
VICTORIOUS INVASION

GAR WOOD INVASION EQUIPMENT INCLUDES (Left to Right)
TROOP & CARGO BODIES • REFUELING TANKS • DUMP BODIES • WRECKER CRANES & WINCHES • BULLDOZERS • SCRAPERS • PATROL BOATS

Answers to Everyday Questions about **PREformed WIRE ROPE**

- 1 Is **PREformed** a lay of rope?
- 2 Is **PREformed** a special construction?
- 3 Just what does **PREformed** mean?
- 4 How shall I mark my orders to get **PREformed**?

These are questions wire rope users are asking. Here are answers to everyday questions we receive.

First, let us be reminded that there are two kinds of rope. One is non-preformed wire rope, the kind that has served users for many years. Then there is **PREformed**, the kind which is newer, better, and longer lasting. Because it is a newer type rope, because it does a much better job for users, there are many questions asked about it. Let's consider a few.

FIRST... "Is **PREformed** a lay of rope?"

No, **PREformed** does not refer to a lay of rope. Lay refers to the twist or helical form which is characteristic of *all* wire rope. A rope may be Lang Lay, Right Lay, Left Lay, Reverse Lay... and each of these lays may be made either **PREformed** or non-preformed.

Lang Lay ropes should always be **PREformed** to counteract the tendency towards twisting, because wires and strands are both laid in the same direction in Lang Lay ropes. Further information on Rope Lay is given in the new Macwhyte Wire Rope Catalog, G-15.

SECOND... "Is **PREformed** a special construction?"

No, **PREformed** is not a special construction. Construction refers to the number and arrangement of wires in the rope... such as 6 x 17 (six strands of 17 wires each), 8 x 19 (eight strands of nineteen wires each), and so on. These constructions can refer to either **PREformed** or non-preformed wire rope. (For complete data on constructions, see Catalog G-15.)

THIRD... "Just what is **PREformed**?"

Macwhyte **PREformed** wire rope is the proper size, grade and construction

you need, **PLUS**. This *plus* refers to the **PREforming**, a process which forms the wires and strands into a spiral, so that wires and strands lie naturally in place with a minimum of internal stress.

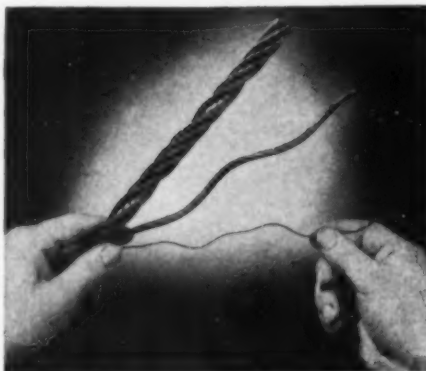


Illustration above tells the story. Notice how the wire has a special shape? It has been **PREformed**. When the rope is closed (put together in the closing machine), both wires and strands naturally fall into position in the rope.



Illustration above points to the end of a **PREformed** rope showing how wires lie naturally in place even though no seizing is there to hold them.

The result is a wire rope that is more flexible and that more quickly adapts itself to the equipment on which it is used. Thus, literally, **PREforming** means better **PER-forming** on the job.

A **PREformed** rope is safer to handle, too, because broken wires (which will happen after *long* usage) do not wicker out as in non-preformed wire rope.

FOURTH... "How should I mark my orders to get **PREformed**?"

Just add the words "Macwhyte **PREformed**" to your specifications. Like this, for example:

1,250 feet 1" 6 x 19 Lang Lay with IWRC, Macwhyte **PREformed** Monarch Whyte Strand wire rope.

If you leave out "Macwhyte **PREformed**," the specification then becomes a non-preformed wire rope specification. The reason? When **PREformed** is not mentioned on the order, it is a standard practice to supply non-preformed.

FIFTH... Internal Lubrication, too!

And a bonus **Plus** feature of Macwhyte **PREformed** wire ropes is *internal lubrication*. Not only are wires and strands **PREformed**, but each wire in the strands is coated with an elastic, non-drying film of lubricant, as explained on pages 10 and 11 of G-15 catalog.

We have been making wire rope for equipment like yours for many, many years. The benefit of that experience is yours for the asking. You can be assured, too, that when you select Macwhyte you are not only getting "the correct rope for your equipment," but also a personal interest in helping you get the *most* out of your rope.

MACWHYTE

PREformed

WIRE ROPE

Plus

Internal
Lubrication

Selected
Steels

Tested-Proved

The correct rope for your equipment

NO. 741

MACWHYTE COMPANY

ARMY
NAVY

Wire Rope

Manufacturers

2941 FOURTEENTH AVENUE

KENOSHA, WISCONSIN

Mill Depots: New York • Pittsburgh • Chicago • Fort Worth • Portland • Seattle • San Francisco. Distributors throughout the U.S.A.

MACWHYTE **PREformed** and
Internally Lubricated Wire Rope

MONARCH WHYTE STRAND Wire Rope
MACWHYTE Special Traction Elevator Rope

MACWHYTE Stainless Steel Wire Rope

MACWHYTE Braided Wire Rope Slings
MACWHYTE Aircraft Cables and Tie-Rods

MACWHYTE Monel Metal Wire Rope

LIMA ADVANTAGES PAY EXTRA DIVIDENDS..

INDEPENDENT CLUTCHES

Independent clutches is one of the greatest advantages a crane, shovel or dragline can have. LIMA cranes, shovels and draglines can hoist, swing, travel and boom up or down at the same time. Imagine the saving in time and convenience of such a feature when working in close quarters.

ANTI-FRICTION BEARINGS

Anti-friction bearings not only help to reduce friction and conserve fuel but they also keep shafts in proper alignment thus assuring a smoother running and longer lived machine.

BIG DRUMS

Big drums go a long way in prolonging cable life. Cable manufacturers recognize the injury to the cable if too small a drum is used. Therefore they recommend that drum diameters be not less than 30 times the diameter of the cable used. LIMA drums in most cases either meet or exceed these recommendations.

There are many good reasons why LIMA Cranes, Shovels and Draglines are doing such a fine job here and at the war front. They are rugged and strong, built to match whatever job there is to do. Independent clutches, big drums, anti-friction bearings and other modern features help keep the job moving at top speed.

Low cost operation, big output under adverse conditions and long dependable service assures complete satisfaction and pride in ownership. Consider these advantages when you plan your future excavating and material handling needs. Remember the name, LIMA, foremost in crane, shovel and dragline design.

LIMA LOCOMOTIVE WORKS, INCORPORATED

Shovel and Crane Division

LIMA, OHIO, U. S. A.

NEW YORK, N. Y. PHILADELPHIA, PA. NEWARK, N. J. MEMPHIS, TENN. ST. LOUIS, MO. DALLAS, TEXAS. PORTLAND, ORE. MINNEAPOLIS, MINN.
SEATTLE, WASH. SAN FRANCISCO, CALIF. LOS ANGELES, CALIF. SPOKANE, WASH. MONTREAL, QUEBEC, CAN. VANCOUVER, B. C.

CRANES

13 TONS TO 100 TONS
CAPACITY

VARIABLE

DRAGLINES

LIMA

SHOVELS

1/4 YARD TO 5 YARDS
CAPACITY

PULL-SHOVELS

A TYPE AND SIZE FOR EVERY MATERIAL HANDLING JOB

CHECK AND DOUBLE CHECK

Check the course of Cummins Dependable Diesels since the beginning—26 years ago. You'll find that the trend has been always toward higher horsepower output per pound of engine weight through HIGHER ENGINE SPEEDS. Then double check the record of Cummins Diesel Power in every heavy-duty service—automotive, industrial and marine. You'll find that the result has been consistently the same . . . increased payloads . . . improved performance . . . higher profits. CUMMINS ENGINE COMPANY, INC., Columbus, Ind.

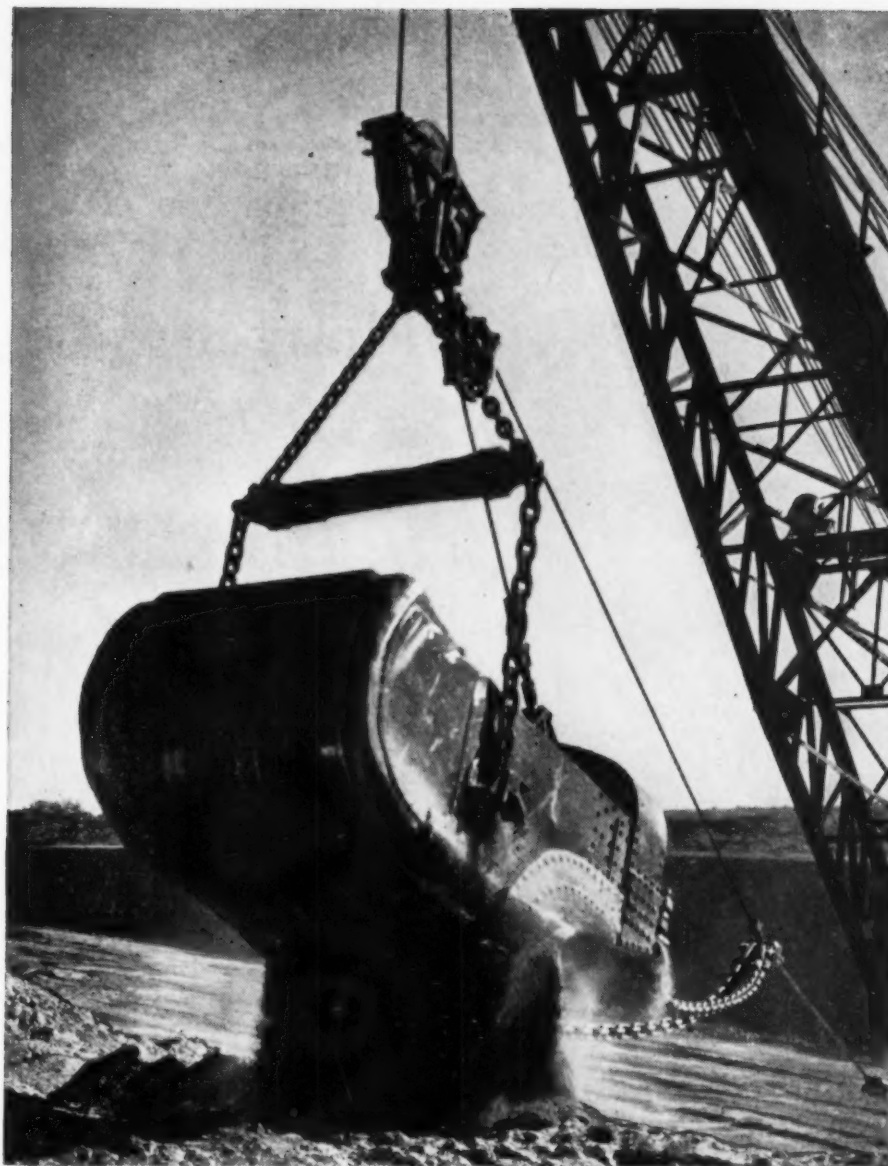
CUMMINS
Dependable
DIESELS



SINCE 1918, PIONEER OF PROFITABLE POWER
THROUGH HIGH SPEED DIESELS



HEAVY-DUTY MODELS FOR AUTOMOTIVE AND INDUSTRIAL SERVICE



IT takes skill on the part of the operator to drop that bucket over the exact spot...skill and well-conditioned wire rope.

To keep their wire rope flexible, protected against core rot, contractors everywhere are lubricating with *Texaco Crater*.

Texaco Crater penetrates to the very core of wire rope, sealing each wire in a tough, viscous film that reduces internal friction and wear, keeps out moisture, prevents corrosion, keeps rope strong longer.

Used on open gears, *Texaco Crater*

cushions load shocks, stops undue wear, quiets the noise. It doesn't ball up, channel or throw off, but clings to tooth surfaces, following through from gear to gear, despite heavy pressures, high temperatures and peripheral speeds.

So effective have Texaco lubricants proved that they are definitely preferred in many fields, a few of which are listed at the right.

Texaco Lubrication Engineering Service is available to you through more than 2300 Texaco distributing points in the 48 States. The Texas Company, 135 E. 42nd St., New York 17, N. Y.

THEY PREFER TEXACO

★ More buses, more bus lines and more bus-miles are lubricated with Texaco than with any other brand.

★ More stationary Diesel horsepower in the U. S. is lubricated with Texaco than with any other brand.

★ More Diesel horsepower on streamlined trains in the U. S. is lubricated with Texaco than with all other brands combined.

★ More locomotives and railroad cars in the U. S. are lubricated with Texaco than with any other brand.

★ More revenue airline miles in the U. S. are flown with Texaco than with any other brand.



TEXACO CRATER

TUNE IN FRED ALLEN EVERY SUNDAY NIGHT—CBS ★ HELP WIN THE WAR BY RETURNING EMPTY DRUMS PROMPTLY

The day the war is over



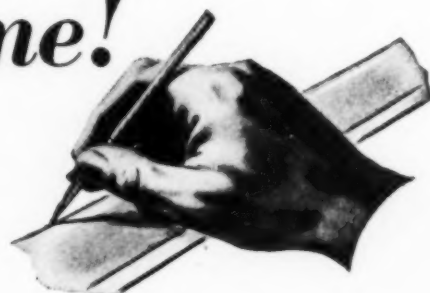
Many jobs will be needed...

Much construction will be needed...

Plans and specifications should be
made NOW.

Call in your architects, engineers
and general contractor.

This is Blueprint Time!

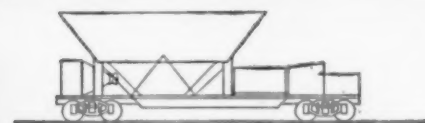
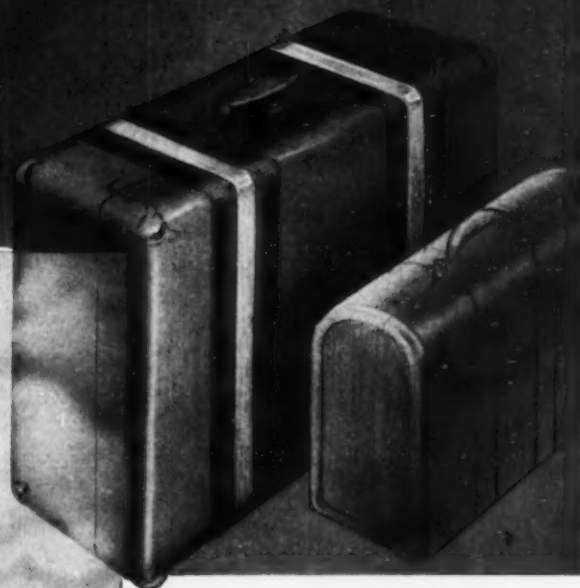
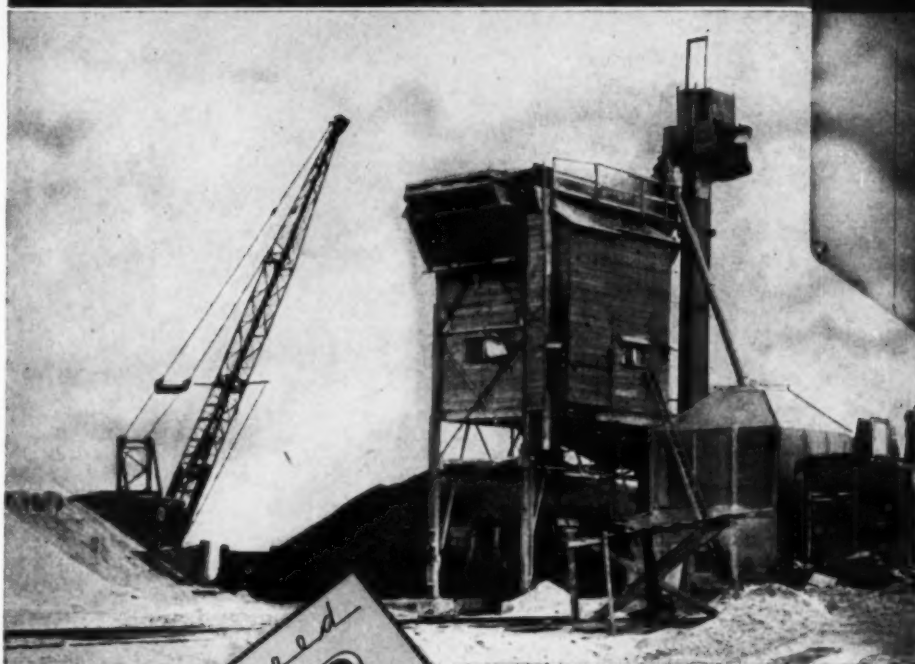


THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA, INC.

NINETY CHAPTERS AND BRANCHES THROUGHOUT THE COUNTRY
NATIONAL HEADQUARTERS—MUNSEY BLDG., WASHINGTON, D. C.

SKILL, INTEGRITY AND RESPONSIBILITY IN THE CONSTRUCTION OF BUILDINGS, HIGHWAYS, RAILROADS AND PUBLIC WORKS

READY TO MOVE— *As A Suitcase!*



Shipped by
FLAT CAR—
No Bin Disassembly

Engineered
BUTLER
Design

Not just bins and batchers,
elevators and conveyors—but
Engineered Design: That's the
reason for the efficiency of
Butler equipment. Ask about:

- Ready mixed concrete plants
- Central mixing plants
- Portable batching plants
- Bulk cement plants
- Sand and gravel plants
- Carscoop

Equipment which can be readily moved from job to job without expensive disassembly is so desirable a feature that many contractors are willing to sacrifice capacity and convenience in order to obtain it. But here is a full-size, high capacity plant ready to move at a moment's notice, ready to go to work in a new location at a surprisingly short time. With 125 tons of bin storage, this plant batched three aggregates and cement to truck mixers at 120 cubic yards per hour consistently—a speed limited only by the capacity of the crane.

Butler ready mixed concrete plants, like all Butler equipment, is designed for your needs; let them serve you as they are serving builders around the world. Write today for Bulletin B-185.



BUTLER
BIN COMPANY
WAUKESHA, WISCONSIN



RCAF Salvages the Bomber —With INTERNATIONAL Power



Stripped of wings, gun turret, engines and machine gun, this R. C. A. F. bomber is on its way to a repair depot. Ahead lies 14 miles of wilderness. The "prime mover" on this job is the rugged International TracTracTor.

NOW it can be told . . . the story of the toughest aircraft salvage job ever attempted by the Eastern Command of the Royal Canadian Air Force in cooperation with detachments of the Canadian Army.

It's the story of an R. C. A. F. bomber that crash landed, with crew uninjured, on the ice of a Nova Scotian lake and the construction of a 14-mile road through forest and dense underbrush to get the plane out. Today the bomber flies again.

The job of getting the bomber off the thawing ice,

dismantling it, and building the road took a large crew five weeks to complete, but it was worth it. And when the day came to start pulling the bomber out, an International TracTracTor furnished the towing power over the temporary road.

Bomber salvage . . . road building . . . dirt-moving. They are all a part of the work of International TracTracTors in wartime, convincing proof that these versatile crawlers have the stamina and built-in performance you want, now and post-war.

INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue Chicago 1, Illinois

INTERNATIONAL POWER



Greater Yardage per Dollar

Hough Hydraulic Loaders on International wheeled tractors have stood the test of time. They have proved economical and speedy in handling dirt, sand, gravel, coal, snow and other bulk materials, handling greater yardage per dollar invested.

Road contractors use them for sub-grading, leveling, charging concrete mixers and black top machines, loading or spreading materials, trimming shoulders and borrow pit work, etc.


Highway departments use them for road maintenance, loading stone, sand and gravel, loading from pits, stock piles, etc.

Municipalities use them for street repairs, handling garbage, snow removal and loading, material handling and loading.

Nationally known users operate up to twenty Hough Tractor Loaders and the value of the many units employed in the war effort is attested to by our "E" flag. The Hough Hydraulic Loader on the International I-6 tractor pictured at the left is at work at a Southern Army post, where it is used for construction work, coal handling and clean-up work.

Ask your International Tractor distributor about the many unusual engineering, construction and operating details of these handy units.


THE FRANK G. HOUGH CO.
Libertyville, Illinois
"Since 1920" 



HOUGH

"HUFF"

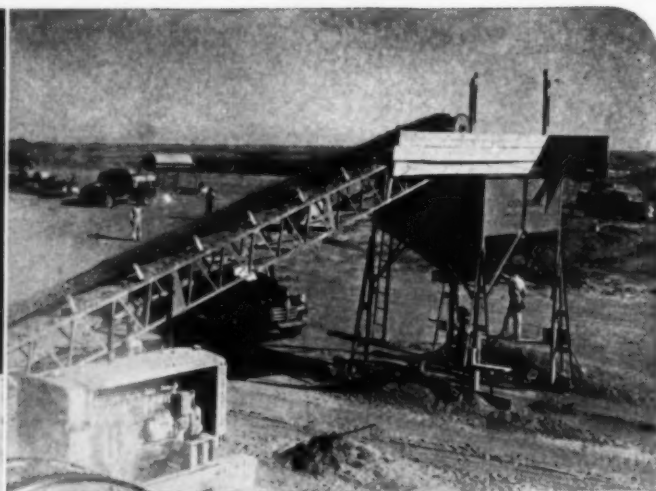
Tractor Shovels



Road Sweepers



*Over 500,000
Yards of
Gravel Per Year!*



Success stories of Universal plants are many. Typical is the one recently received from Cage Bros. & J. Floyd Malcolm, Texas, gravel producers. They have given us the following report on their Universal Gravel Crushing, Screening and Loading Plant:

Maximum yardage per hour: 400 yards of material 2" and under.

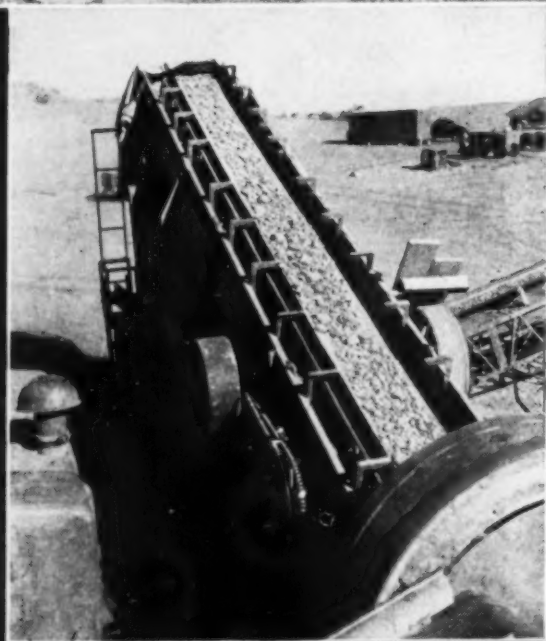
Average production in continuous operation: 275 yards per hour.

Average annual production: over 500,000 yards.

This compact portable plant consists of a 1036 primary jaw crusher, 40"x 24" secondary roll crusher, 2½ deck 4'x 12' screen, rotovator and conveyors—a lot of gravel produced with a minimum of equipment.

Ask any user of Universal equipment about production costs, fuel consumption, bearing life, maintenance costs and other operating factors. *When results are checked, Universal is the choice!*

UNIVERSAL ENGINEERING CORP.
327 8th Street, West Cedar Rapids, Iowa



Get Behind the A.R.B.A.!

Officials of the American Road Builders' Association have issued a plea to members, affiliated organizations and other interested parties to launch a well integrated post-war highway building program at once so that the wheels can be set in motion immediately upon conclusion of the war.

A copy of "A Sound Plan," detailing the program to hedge against post-war deflation is available to those interested, from the A.R.B.A., 1319 F St. N. W., Washington, D. C.

UNIVERSAL
CRUSHERS, PULVERIZERS, COMPLETE PLANTS, SPREADERROLLERS, PORTABLE ASPHALT PLANTS

SMITH MARCHES ON...

Continuous Program of Improvements Throughout the Years

Wars may come and wars may go, but Smith continues uninterruptedly with its program of designing and building BETTER concrete mixers for the construction industry. The Smith duo-cone tilting-type mixer made its initial appearance immediately following the Spanish-American War. Forerunner of the famous Smith line of concrete mixers, this first machine made history in the construction industry. Year after year, important

improvements were made: such as pneumatic or hydraulic tilting mechanism — anti-friction bearings — automotive type transmission — front-end-charging — welded box girder frame and pedestals — forged steel rollers — machine cut drum drive gear, etc. Today, Smith is carefully laying the groundwork for further improvements in concrete mixer design—refinements that will result in even greater mixing speed and efficiency.

LOOK TO SMITH for your post-war concrete mixer requirements. Remember, every machine is backed by almost a half-century of specialized mixer building experience.

THE T. L. SMITH COMPANY
2851 N. 32nd St., Milwaukee 10, Wis.



CONCRETE MIXER MANUFACTURERS SINCE 1900

A 4367-1P

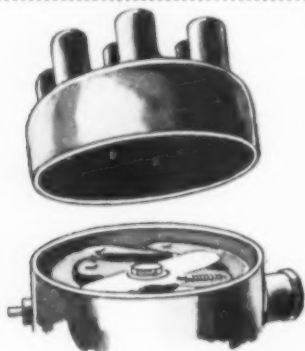
Make sure your preventive maintenance plan checks these possible gas-wasters!



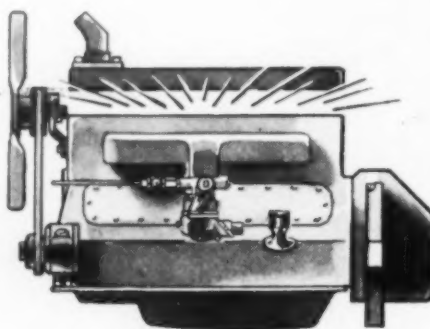
Dirty air cleaners can cut gasoline mileage as much as 40%. This form of gas waste is hard to catch. In many instances it happens without any sign to drivers or maintenance men of poor engine performance. Clean air cleaners regularly.



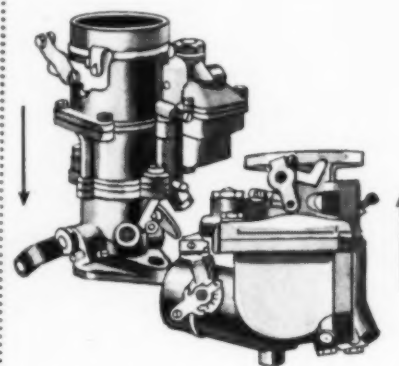
Fouled or burned spark plugs can cut off the last mile in every ten. It's so easy to inspect and adjust them—better too often than too late.



Worn distributor points and improper timing may not be serious enough to stall a truck, but they can still cause excessive gas consumption. Be sure these items get more than a "look and a promise" when preventive maintenance work is being done.



Idling engines waste gasoline. Worse than that, engines literally "idle their heads off." Idling causes carbon formation, fouled plugs and valves, which requires frequent removal and cleaning of cylinder heads.



High carburetor float levels have often been found to cause excessive gasoline consumption. Even a small amount of wear on float linkage and needle valve changes the carburetor adjustment.

To get the last mile from every gallon of gas—In the big job of saving irreplaceable equipment, scarce tires, parts and labor, don't lose sight of the important part your p. m. plan can play in gasoline saving. It's doubly important now—it's a contribution to the war effort—it may mean the difference between a profitable and unprofitable year for you.

Make sure your p. m. plan includes the steps listed here to help get the last mile from every gallon of gasoline you use. Standard Automotive Engineers have other suggestions—

and modern testing instruments as well—for locating possible sources of gasoline saving in your fleet. Ask the Standard Oil Man who calls on you about this Automotive Engineering Service. It is available to all fleet operators in the Middle West. Or write the Standard Oil Company (Indiana), 910 S. Michigan Avenue, Chicago 80, Illinois for the Engineer nearest you. In Nebraska, write Standard Oil Company of Nebraska at Omaha 2.

Gasoline Powers the Attack—Don't Waste a Drop!

STANDARD OIL COMPANY (INDIANA)

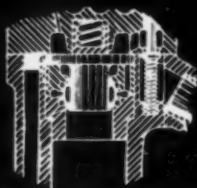
STANDARD SERVICE

★ FLEET CONSERVATION SERVICE

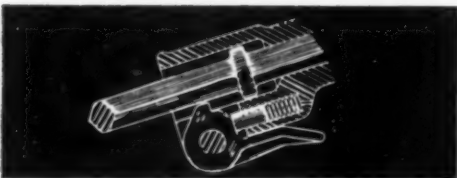
Thor No. 25 PAVING BREAKER



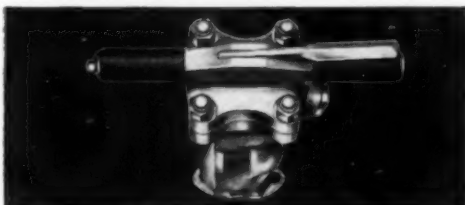
**These THOR
Features Speed
Heavy
Demolition Jobs!**



• **Positive Short-Travel Tubular Valve**—Gets every ounce of power from every foot of air entering the machine. Actuates a block type piston that minimizes vibration to provide handling ease. Provides low air consumption.



• **Latch Type Retainer**—Simple, fast and easy to operate. Spring detent holds retainer in closed position . . . Pressing with the foot releases the tool. No adjustment is required during insertion of the tool.



• **4-Bolt Back Head**—Special design maintains rigidity between the back head and cylinder, eliminating air leakage and excessive bolt breakage when machine is used for prying. Made of drop forged, heat treated alloy steel. Equipped with rubber grips that keep the handle cool at all times.



BUILT for Heavy Duty . . . DESIGNED for Fast, Easy Handling

The Thor No. 25 Paving Breaker is the heavy duty "boss" of the Thor demolition crew . . . *built* for the hardest kind of jobs, yet *designed* to provide handling ease that gets those jobs done faster.

Ruggedly built from alloy-steel drop forgings, equipped with a sturdy 4-bolt back head for maximum strength and rigidity, this heavy duty Thor Breaker combines *operating ease* with *power* to make quick work of the toughest demolition jobs in pavement, walls, columns, piers, foundations and the like.

For more information about this powerful, easy operating, heavy duty Thor No. 25 Paving Breaker and full details about light and medium duty Thor Breakers in the complete Thor line of contractors air tools write today for Catalog 42-A.

Thor

Portable Pneumatic and Electric Tools

INDEPENDENT PNEUMATIC TOOL COMPANY



600 W. JACKSON BOULEVARD, CHICAGO 6, ILL.

Branches in Principal Cities

Why "PACKAGED" Bridges and Sewers are Popular with Contractors

This stack of plates built nearly
200 feet of 120-in. diameter pipe.



Erecting a "packaged" culvert, 165 inches in diameter.

Just as shipbuilding methods have been revolutionized by prefabrication and other time-saving methods, so will post-war construction be simplified and speeded by product manufacturers and contractors. One of these practical ideas is the "packaging" of small bridges and large sewers.

Almost as simple as changing a tire on an automobile is the assembling and bolting of ARMCO Multi Plate. The easily-handled, pre-curved corrugated plates are nested together for

saving space in shipping, hauling and storing. Construction is done with unskilled labor and the simplest equipment and small tools.

The "form" is the finished structure. No curing, no waste, no delay. Other operations are speeded up too.

ARMCO pioneered and developed this "packaged" product. Before the time comes to bid and build these structures, get complete information from Armco Drainage Products Association, 355 Curtis Street, Middletown, Ohio.



ARMCO

Multi Plate

**SOMETHING NEW
IN ROAD MAINTENANCE**

PROJECTIVE MAINTENANCE

for lasting benefits



EXPEDITE CONCRETE PAVEMENT PATCHING
STABILIZE SHOULDERS FOR PAVEMENT WIDENING
CONSOLIDATE LOOSE GRAVEL SURFACES
STRENGTHEN WEAK BASE COURSES
PREVENT DETRIMENTAL FROST ACTION

from subsoil to surface
with **CALCIUM CHLORIDE**

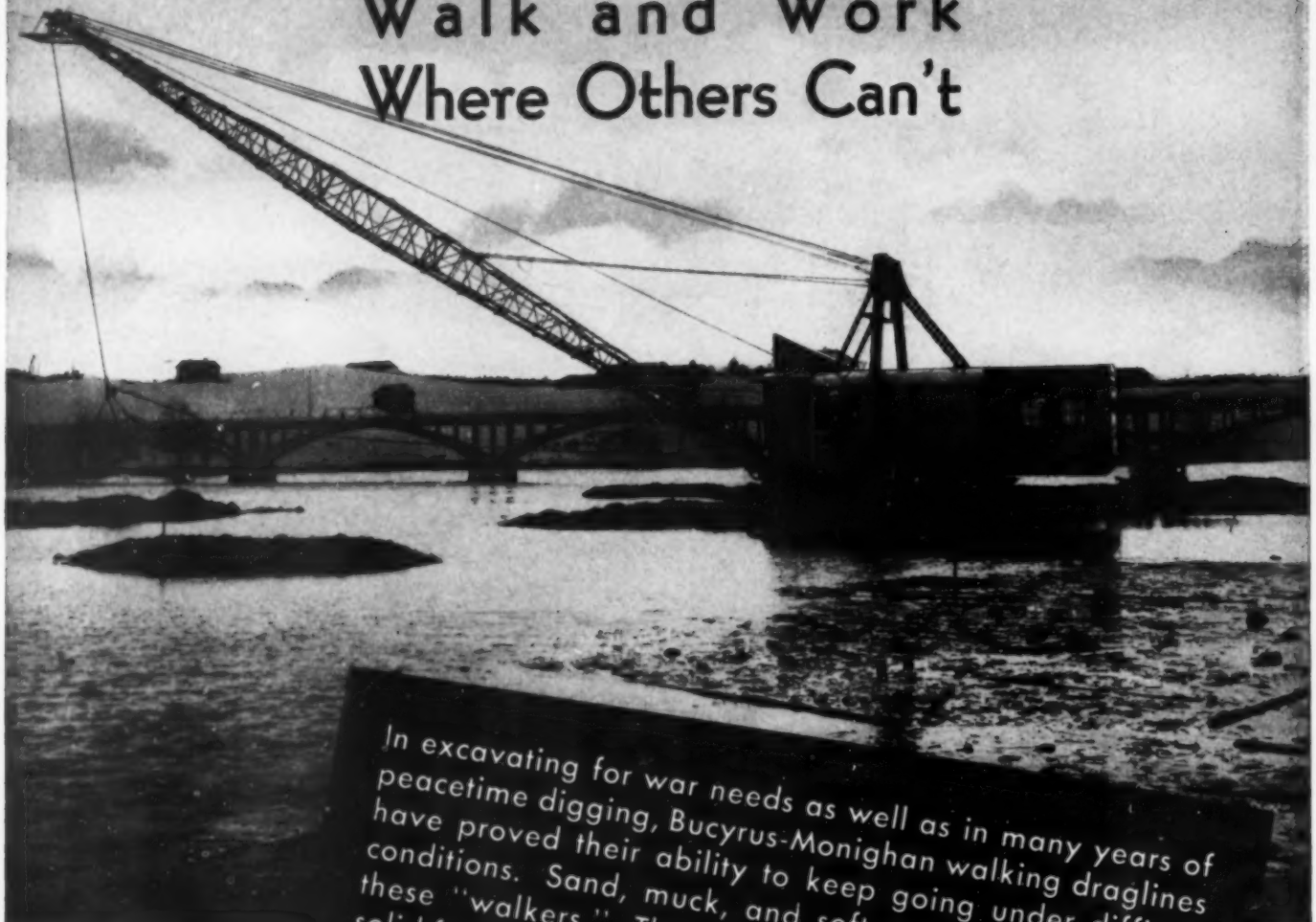
**Write for this
New Bulletin**

This Bulletin shows how maintenance can combat wartime road deterioration and provide a better foundation for postwar highways. It is full of helpful suggestions on materials and methods and is mailed on request.

CALCIUM CHLORIDE ASSOCIATION • 4145 Penobscot Building, • Detroit 26, Mich.

BUCYRUS-MONIGHANS

Walk and Work
Where Others Can't



AVAILABLE
with
BOOMS
80 ft. to 250 ft.
BUCKETS
3 to 25 Cu. Yds.

In excavating for war needs as well as in many years of peacetime digging, Bucyrus-Monighan walking draglines have proved their ability to keep going under difficult conditions. Sand, muck, and soft ground will not stop these "walkers." Their large bearing areas give them solid footing on ground too soft for other machines. Their easy maneuverability and smooth walking traction permit them to step around trouble. Their simple construction keeps maintenance low and allows them to deliver steady performance.

Add to these features the high output for which Bucyrus - Monighans are famous and you have a big reason for including these field-proved machines in your excavating equipment. Plan now to take advantage of Bucyrus-Monighan ability to help solve your excavating problems fast and efficiently.

**BUCYRUS
MONIGHAN**

SOLD BY

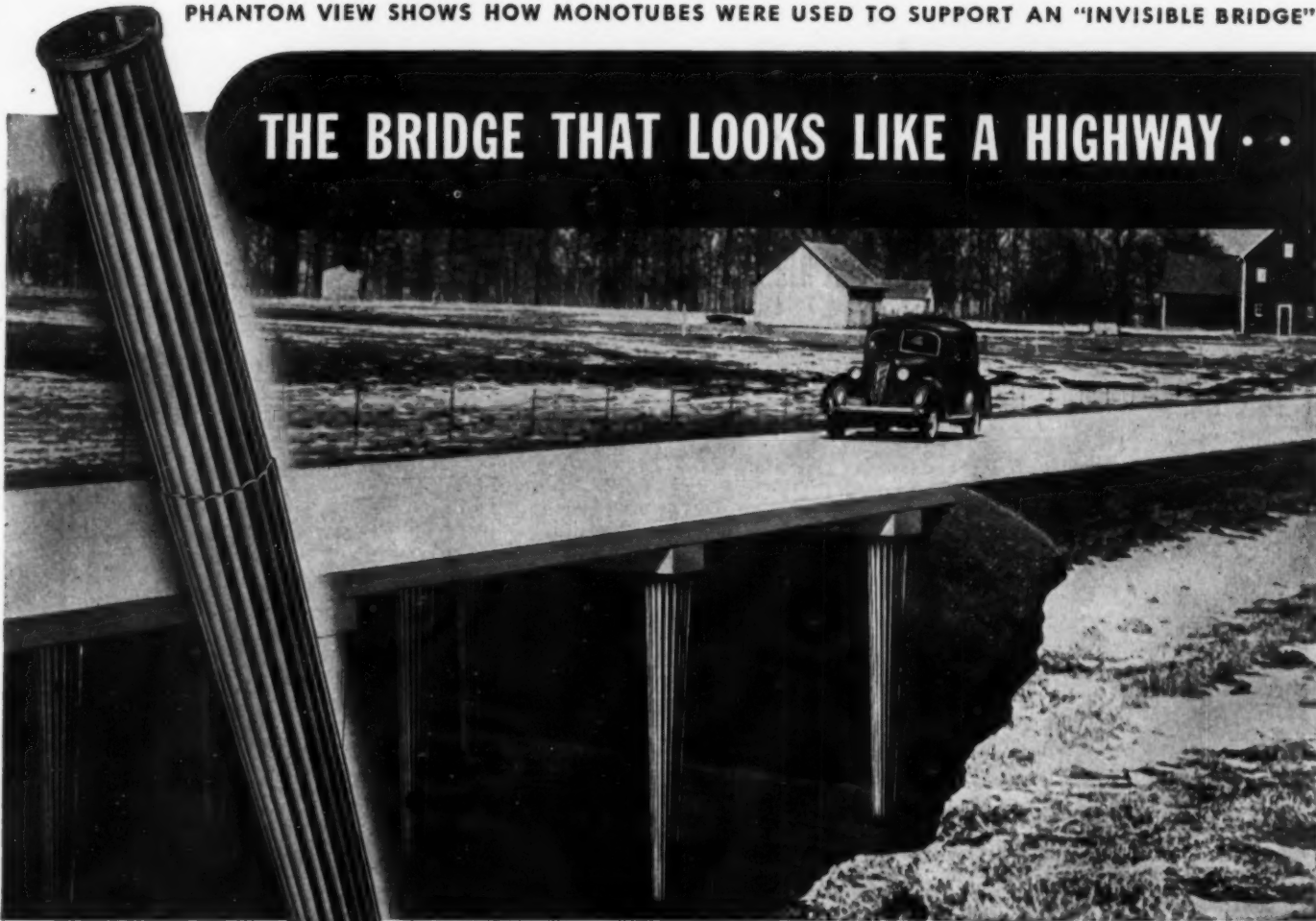
BUCYRUS-ERIE COMPANY

SOUTH MILWAUKEE,

WISCONSIN

PHANTOM VIEW SHOWS HOW MONOTUBES WERE USED TO SUPPORT AN "INVISIBLE BRIDGE"

THE BRIDGE THAT LOOKS LIKE A HIGHWAY . .



Contractor: Gradle Brothers, Inc., Carmel, Ind. Engineer: Paul Sawyer.

. . Built on Extendible Monotubes

Detail showing how Monotubes are extended in the field to make possible the installation of varying pile lengths quickly and economically.



TO the casual observer, there is nothing unusual about the stretch of highway pictured above. But to the engineers and contractors who built it, here is a very unique project.

On U. S. Highway 31, near Kokomo, Indiana, a troublesome muck pocket condition exists that is much too soft to support an ordinary concrete road. Indiana State Highway Commission's answer to the problem was to drive Union Metal tapered steel Monotubes to refusal at 20 to 65 ft. depths. These Monotubes were then filled with concrete, and capped, and bridge slabs were built directly on the fill. Result: an invisible bridge consisting of 32 spans and stretching for 583 feet . . . a highway that will not break up or sink, a highway that will last for years without costly repairs.

The ease with which Monotubes can be driven and extended to meet varying depth requirements without delay or waste, contributed in a large measure to the success of this achievement.

Tapered, all-steel Monotubes are light yet sturdy—easy to handle and drive, simple to inspect. And they are available in a gauge, size, and taper to meet the most exacting requirements in any soil condition. Write for your free copy of the Monotube Catalog 68A to The Union Metal Mfg. Co., Canton 5, Ohio.



UNION METAL



Monotube Pile Casings



Two facts add up to big savings in construction costs

No contractor or engineer will argue about Fact No. 1. All who have used Lehigh Early Strength Cement will agree with Fact No. 2.

Below are a few actual cases in which the use of Lehigh Early Strength Cement resulted in sizeable cost savings—as well as quicker completion.

\$2,000 saved on this hospital! Instead of waiting 21 days before removing forms, only 7 days were required. According to the contractor, Lehigh Early Strength Cement helped put the job back on schedule; saved about \$2,000 in overhead, salary, labor costs and forms.



Saved \$500 a day on this tunnel!

After a race against time, the contractor reported, "By using Lehigh, we were able to strip forms in 10 hours, giving us a pour every day. Completion was imperative to avoid paying a penalty of \$500 per day. By using early strength cement, we were able to keep down our cost of forms, avoid excess penalty and cut cost of overhead."



Saved \$1,100 plus in winter weather!

To speed construction during a Wisconsin winter the contractor on this office building used Lehigh Early Strength Cement. He reports a 50% saving in cost of temporary heat and another \$1,100 saved in pans and adjustable joists because he could strip forms in three days.

LEHIGH EARLY STRENGTH CEMENT for service-strength concrete in a hurry

LEHIGH PORTLAND CEMENT COMPANY • ALLENTOWN, PA. • CHICAGO, ILL. • SPOKANE, WASH.



YOU'LL FIND NO "OIL HOGS" HERE

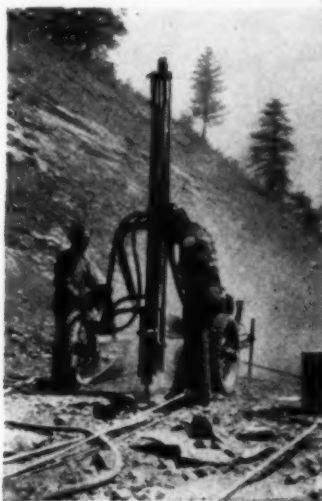
NOT with Gardner-Denver Water Cooled Portable Compressors on the job!

Because they are fully water cooled, they run cooler—use less lubricating oil. Rarely is it necessary to add any oil between regular oil changes.

And because they run cooler, they deliver cooler air—cause less wear on hose.

You'll find Gardner-Denver "Portables" equally efficient in winter or summer—at high altitudes or low. In winter, warm water from the engine circulates through the cylinder jackets, thoroughly warming the compressor before it is started. In summer, the circulating water keeps the compressor cool.

Investigate these "oil saving" water-cooled compressors and other Gardner-Denver cost-cutting equipment. Write Gardner-Denver Company, Quincy, Illinois.



For faster drilling and extra maneuverability, even over the roughest ground, check the Gardner-Denver UM-99 Wagon Drill. Ability to handle full six-foot steel changes quickly, means faster drilling on deep holes.



GARDNER-DENVER

Since 1859

How Does Moretrench Handle a Wet Job?



PIPELINE RIVER CROSSING
SOUTH CANADIAN RIVER, OKLAHOMA

DUG "in the dry" with a
MORETRENCH WELLPOINT SYSTEM

No sheeting needed—crane operates close
to ditch.

- 1 An experienced engineer plans the wellpoint set-up to dewater your particular work efficiently in the most economical way.
- 2 A-1 equipment, shipped from stock, arrives in good condition on the job — when you want it.
- 3 A skilled demonstrator, veteran of a hundred jobs, installs the system, instructs your men in its care and operation, and makes sure you're going along "in the dry" before he leaves.

Does it cost a little more?

Yes — at first! The final cost is a different story. *Less units — lower installing and operating expenses — guaranteed results.* These are what count in the end. Let us show you on your wet work.

• MORETRENCH CORPORATION

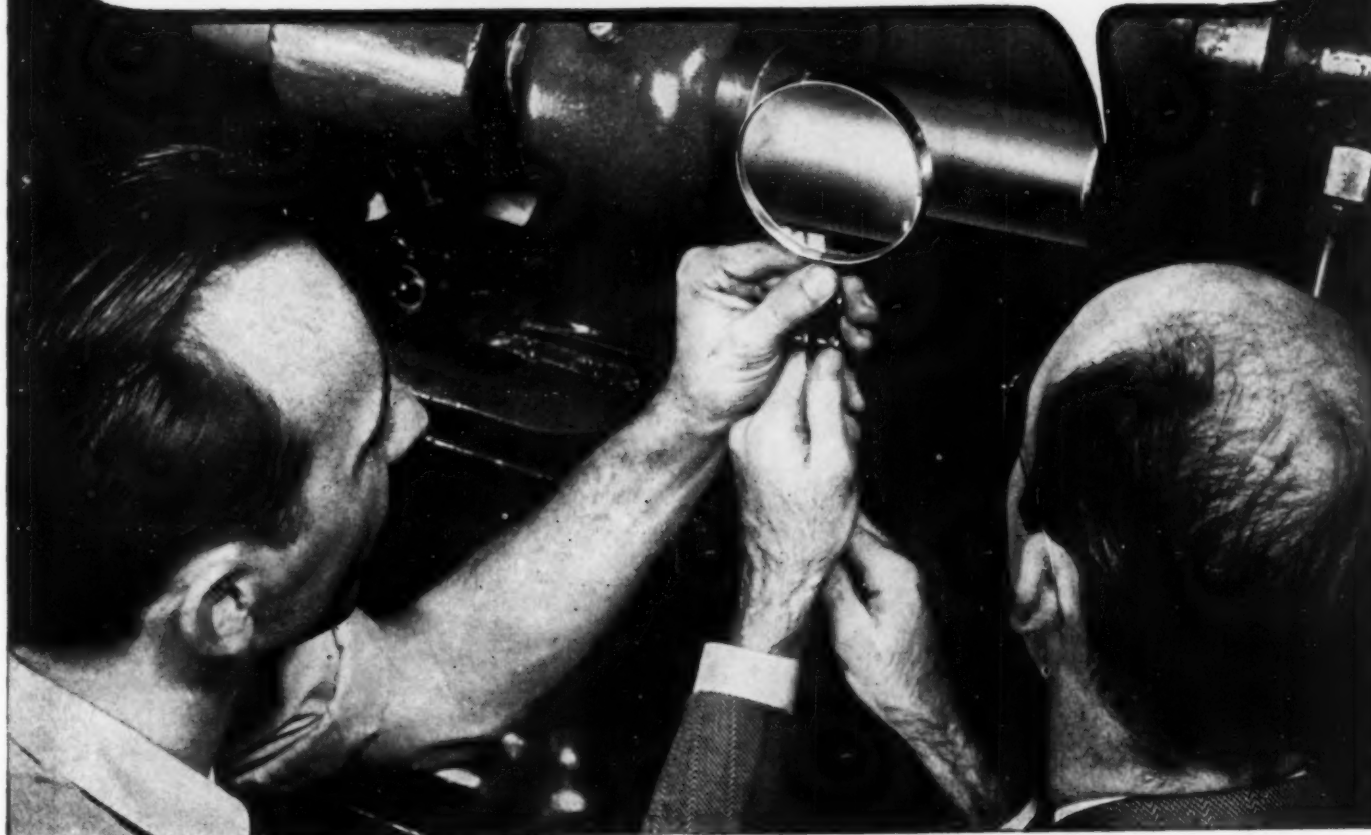
90 WEST STREET, NEW YORK 6, N. Y.

3037 S. CHRISTIANA AVE.
CHICAGO 23, ILL.

ROCKAWAY, N. J.

321 EUTERPE ST.
NEW ORLEANS 11, LA.

THAT'S WHAT I CALL A LUBRICATION JOB



The LUBRIPLATE film is tough...the toughest lubricating film you have ever used. It holds contacting surfaces apart, even under the heaviest loads, thus effectively preventing progressive wear. Examination of a bearing surface lubricated with LUBRIPLATE always shows a mirror finish.

LUBRIPLATE is a most exceptional lubricant. It keeps friction down to a minimum, thus conserves power. It prevents rust and corrosion. Its effective life is longer than conventional lubricants, therefore it is more economical to use.

The remarkable achievements of LUBRIPLATE are told in the "LUBRIPLATE FILM." It contains case histories and general lubricating information written especially for your industry. Send for a copy today.

LUBRIPLATE DIVISION

FISKE BROTHERS REFINING COMPANY

NEWARK, N. J.

SINCE 1870

TOLEDO, O.

WRITE FOR THE NAME OF THE DEALER NEAR YOU

R FOR YOUR MACHINERY

No. 3—Ideal for general oil type lubrication. Ring oiled bearings, wick feeds, sight feeds and bottle oilers.

No. 8—Because of its high film strength and long life reflects outstanding performance in most types of enclosed gears (speed reducers).

No. 107—One of the most popular grease type products for general application by pressure gun or cups.

No. 70—For a wide range of grease applications, especially at temperatures above 200 degrees F.

No. 130-AA—Known nationwide as the superior lubricant for open gears, heavy duty bearings, wire rope, etc.

BALL BEARING—This is the LUBRIPLATE lubricant that has achieved wide acclaim for use in the general run of ball and roller bearings operating at speeds to 5000 RPM and temperatures up to 300 degrees F.



The Story of the Kid from Port Chester

"Dear Mom," he writes, "Today I got a thrill.

"We were going ashore to attack . . . going ashore in a barge when just as we were reaching the beach something hit us hard. We turned over and everyone of us and all the equipment in the barge took a nose-dive in the drink.

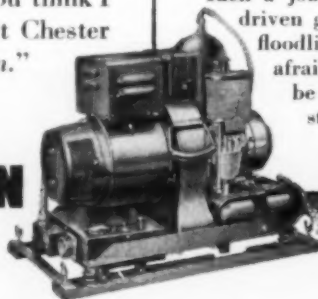
"Fortunately it wasn't deep, and we were able to walk ashore and drag the equipment with us. We were assigned to take some of the pieces of equipment and dry them out as best we could. Which we did. And never thinking they'd be any good again, we tried to get them going.

"Much to everyone's surprise the darn things started up and worked. But if you think that was a surprise, how do you think I felt when I noticed that this equipment came from Port Chester . . . Homelite Portable Generators, *made in my home town.*"



HOMELITE CORPORATION

PORT CHESTER, NEW YORK



Some day it's going to pour

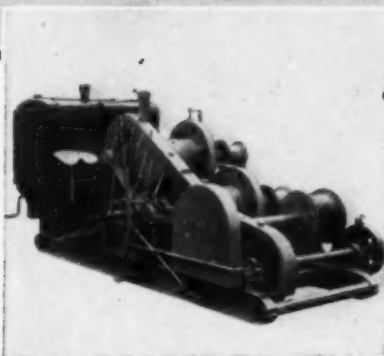
Yes, it will be raining cats and dogs . . . but nevertheless important construction and emergency repair work must be done. On such a job, the portable gasoline-engine-driven generator you need to operate floodlights or power tools cannot be afraid of the rain. The answer will be a Homelite. They can't be stopped by rain.

AMERICAN

**MATERIALS HANDLING
FOR EVERY INDUSTRY**



AMERICAN Locomotive Crane at aggregate plant.



AMERICAN General Purpose Hoist.

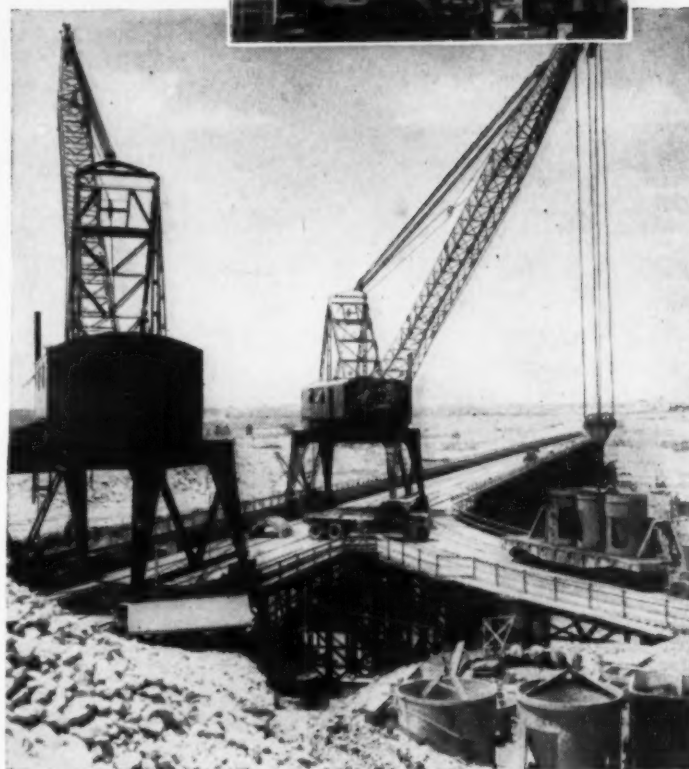


AMERICAN Stiffleg Derrick.

AMERICAN REVOLVERS ON LARGE DAM CONSTRUCTION

The ideal materials handling method for any construction job is dictated to a great extent by the size and type of project. For many years now, dams and similarly large construction projects have proved the AMERICAN REVOLVER a natural for placing reinforcing steel, forms, pouring concrete, and stripping forms. For handling materials with hook, magnet or bucket, there is a choice in size, capacity and type of power to meet a variety of conditions.

Maybe, for your larger work the AMERICAN REVOLVER—a gantry mounted revolving crane—is the ideal materials handling method. Now is the time to look into it. Catalog 400-R-1B gives full particulars on application and construction features.



AMERICAN REVOLVERS doing a materials handling job at dam project.

4413

Plan now . . . but wait for AMERICAN!

AMERICAN

**MATERIALS HANDLING
for EVERY INDUSTRY**

AMERICAN HOIST & DERRICK CO.

Saint Paul 1, Minnesota

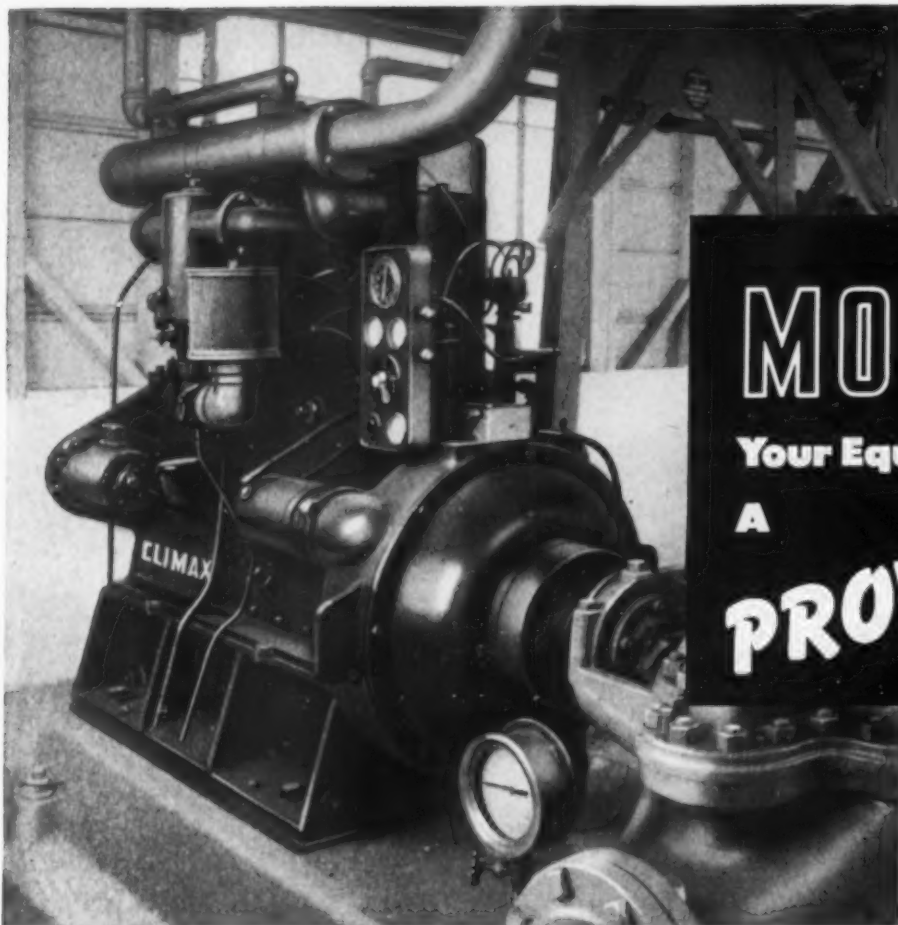
CHICAGO

SAN FRANCISCO

NEW YORK



Wherever
wire rope is fastened
... use genuine
CROSBY CLIPS
with the Red-U-Bolt



MODERNIZE

Your Equipment Drives With

A PROVED Climax ENGINE

Standby power for the fire protection reservoir and pumping station in an aircraft plant is furnished by this Climax Model N4B engine.

HERE ARE A FEW ADVANTAGES YOU GET BY INSTALLING A CLIMAX ENGINE DRIVE ON YOUR PRESENT OR POSTWAR MACHINERY . . .

A Climax engine will put new life into existing equipment, multiply its output and lengthen its productive life. The changeover can be made with a minimum of difficulty and at moderate cost. For new equipment, a Climax engine may be specially designed, equipped and rated for the job, then standardized.

For Stationary Installations these engines provide an unfailing source of power and give a lifetime of trouble-free service. They operate at low, medium, constant or variable speeds and burn natural gas, butane or gasoline. Climax engines are

simple and easy-to-understand. There are no delicate adjustments to be made, no exacting tolerances. Every part subject to wear can be replaced easily and inexpensively by regular mechanics. Specially trained men are not needed.

For Portable Service Climax engines are compact, adaptable and easy to install. They are built to take punishment and frequent overloading without impairing their output or efficiency. Their design flexibility and ease of relocation permit them to be hooked up to multiple installations, and make profits the whole year round.

"For High Achievement
in the Production of War Material".

Climax

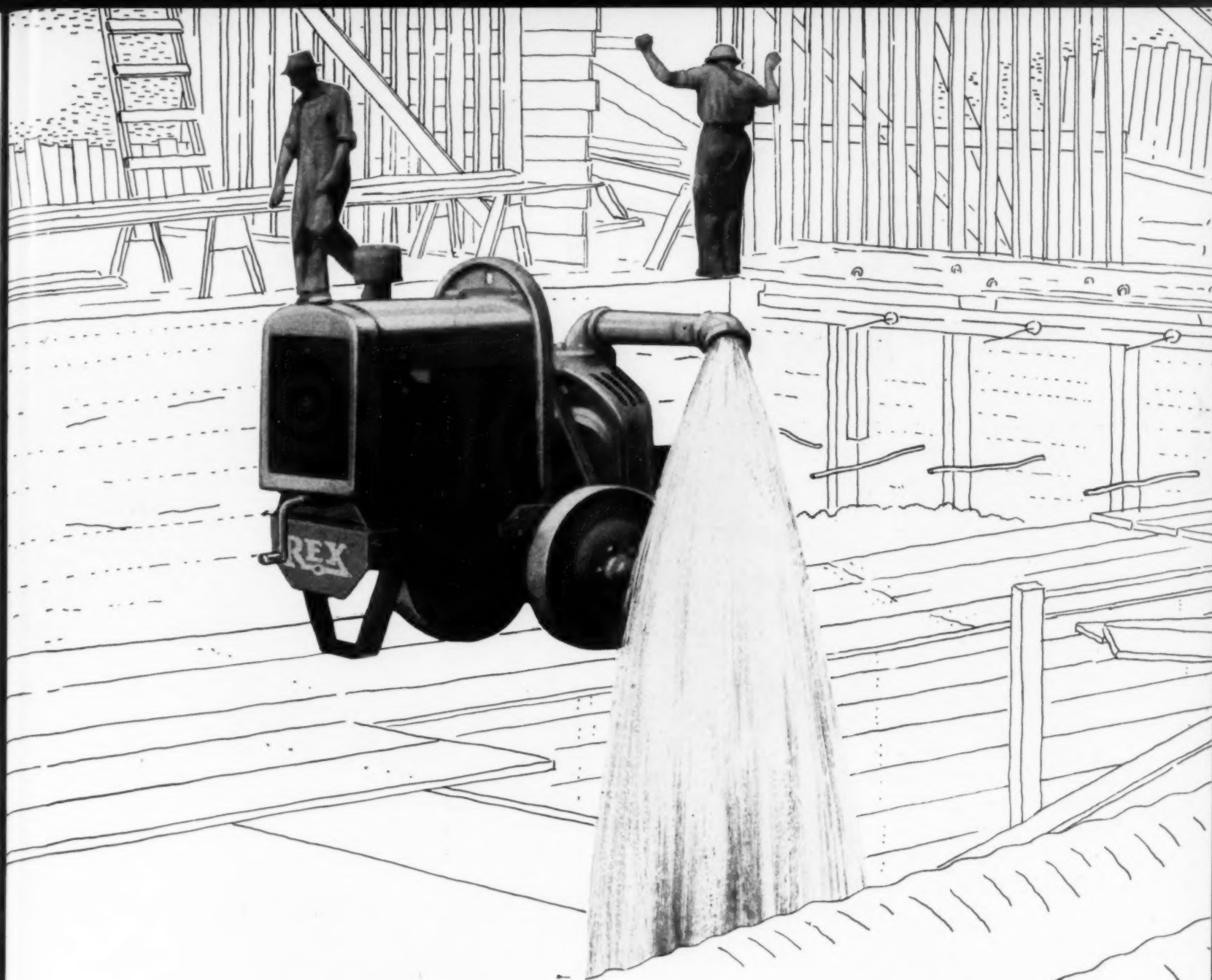
Engineering Company

GENERAL OFFICES & FACTORY:
CLINTON, IOWA

REGIONAL OFFICES: CHICAGO, ILL., DALLAS, TEXAS

CLIMAX ENGINES are 4, 6, 8 and 12 cylinder gas engines with ratings from 8 to 495 h.p. Climax Diesel engines are made in two models rated at 22 and 44 h.p. The gas engines operate on natural gas, butane or gasoline.

FOR COMPLETE INFORMATION write Climax Engineering Company, 1807 South Fourth Street, Clinton, Iowa.



You start the motor— it does the rest!

When you use a Rex Speed Prime Pump, all you have to do is start the motor—it practically operates itself. You don't have any worries about priming or re-priming. That's all handled automatically by the Rex recirculating valve and the sensational "Air-Peeler" that literally peels air from the impeller and rushes it out the discharge. This fast automatic prime and great air handling ability allows a Rex Pump to start moving water in the shortest possible time.

Rex Pumps are built for service, too. Their "Free-Flow" design eliminates water "detours"—assures a straight-line flow that increases pump efficiency. It's natural, though, that Rex Pumps should be designed

right. They are made by the manufacturers of Rex Mixers, Moto-Mixers, Pavers and Pumpcrete which have been outstanding performers in the construction field for many years.

For information on Rex Pumps, send for Bulletin No. 433. And check the other Rex construction equipment: Mixers, to cut concrete placing costs; Moto-Mixers that speed the mixing, hauling and placing of concrete . . . Pavers that can give you really heavy yardage production faster—Pumpcretes, the pumps that pump concrete by pipeline. See your Rex Distributor or write to Chain Belt Company, 1664 W. Bruce St., Milwaukee 4, Wis.



CHAIN BELT COMPANY of Milwaukee



CONSTRUCTION MACHINERY



PUMPS



PAVERS



PUMPCRETES



MOTO-MIXERS



MIXERS

ALWAYS ON THE JOB

from the jungles of New Britain to the shores of Italy

YES, we mean the three big Goodyear work tires you see below. If you watch the newsreels, you'll be surprised how many times you see these famous treads on equipment being landed by America's invading forces.

Goodyear off-the-road tires are widely used by Navy Seabees and Army Engineers for jungle-clearing, road- and airfield-building, and all heavy-duty earth-moving jobs, for the same reasons that make them first choice of contractors here at home.

Supertwist, All-Weather, Sure-Grip—T.M.'s The Goodyear Tire & Rubber Company

They're built for tough going — armored with low stretch Supertwist cord; toughened by multiple compounding. They're big — with enough flotation to carry heaviest loads safely. And their treads are scientifically designed to provide maximum traction in sand, mud, marsh or rocky going.

Best proof of that is the fact "more tons are hauled on Goodyear truck tires than on any other kind." Today it's more important than ever to specify Goodyears — because Goodyear's experience

as the world's largest tire builder insures a "plus" in quality you won't find elsewhere. —

GET THIS FREE GUIDE TO BETTER TIRE SERVICE

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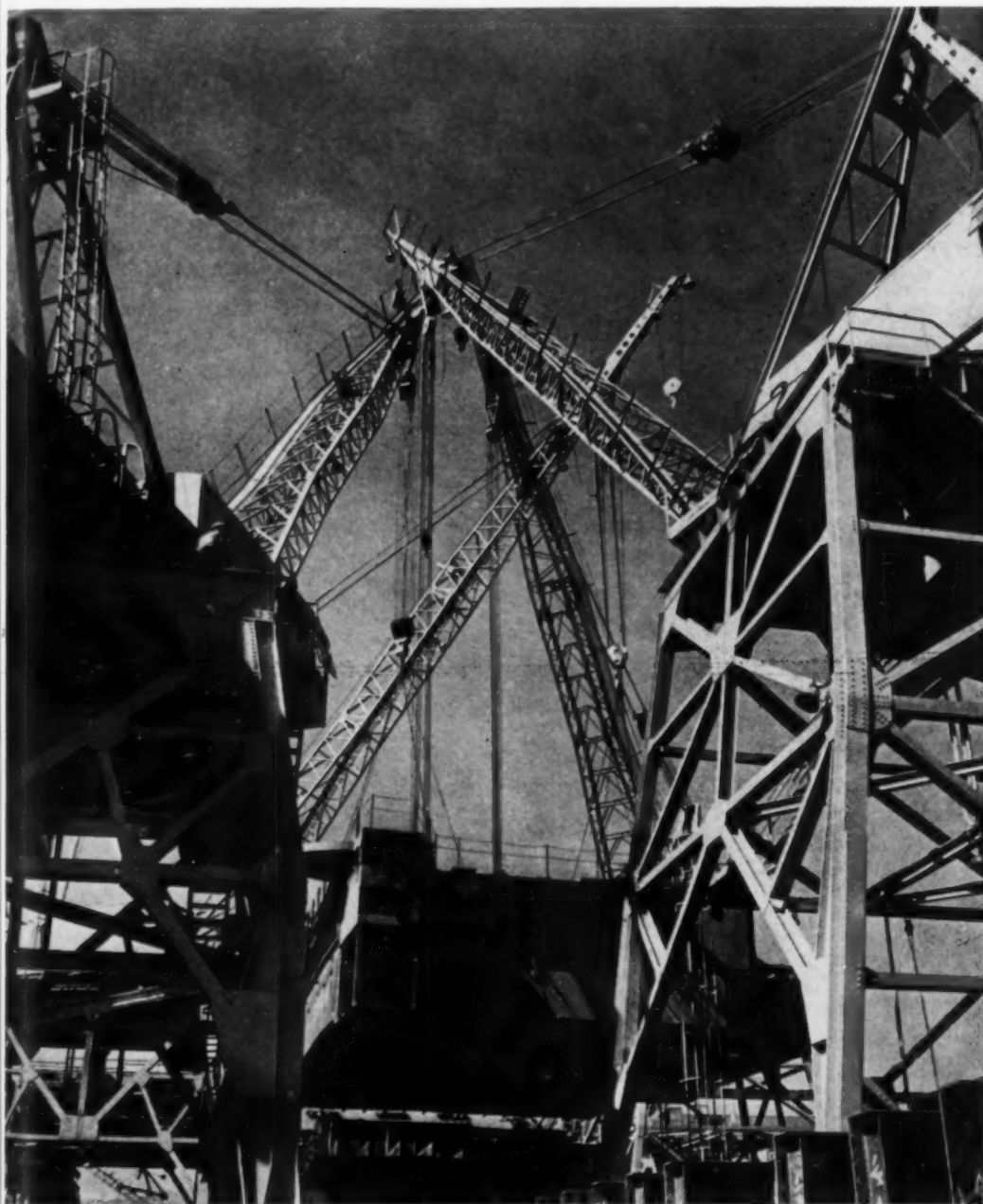
Construction Methods

ROBERT K. TOMLIN, Editor

Volume 26

MAY, 1944

Number 5



LOAD IS TRANSFERRED in midair to cranes operating between ways and at right angle to cranes making original lift. All four booms are in use. Keeping booms and lines untangled is delicate job.

Marinship Photos

TRICKIEST JOB in the construction of the Liberty freighter *S.S. Sun Yat-sen* by the Marinship Corp., at Sausalito, Calif., was the transfer of the heavy deckhouse assembly between four shipyard cranes on high gantries without landing it on a support. Two cranes traveling on rails across the land end of the launching ways picked up the 90-ton steel unit from the assembly skids. For placing in position, the load had to be transferred to cranes operating between

the ways and at a right angle to the cranes making the original lift.

It was necessary to travel and swing the two rigs simultaneously with a load requiring almost the full lifting capacity of the cranes. Four point pick-ups were used from each crane to distribute the lifting stress in the assembly. After transfer, the unit had to be lifted over the forepeak of the vessel, which was especially high on end-launching ways requiring careful arrangement of slings.

Deckhouse Assembly

Weighing

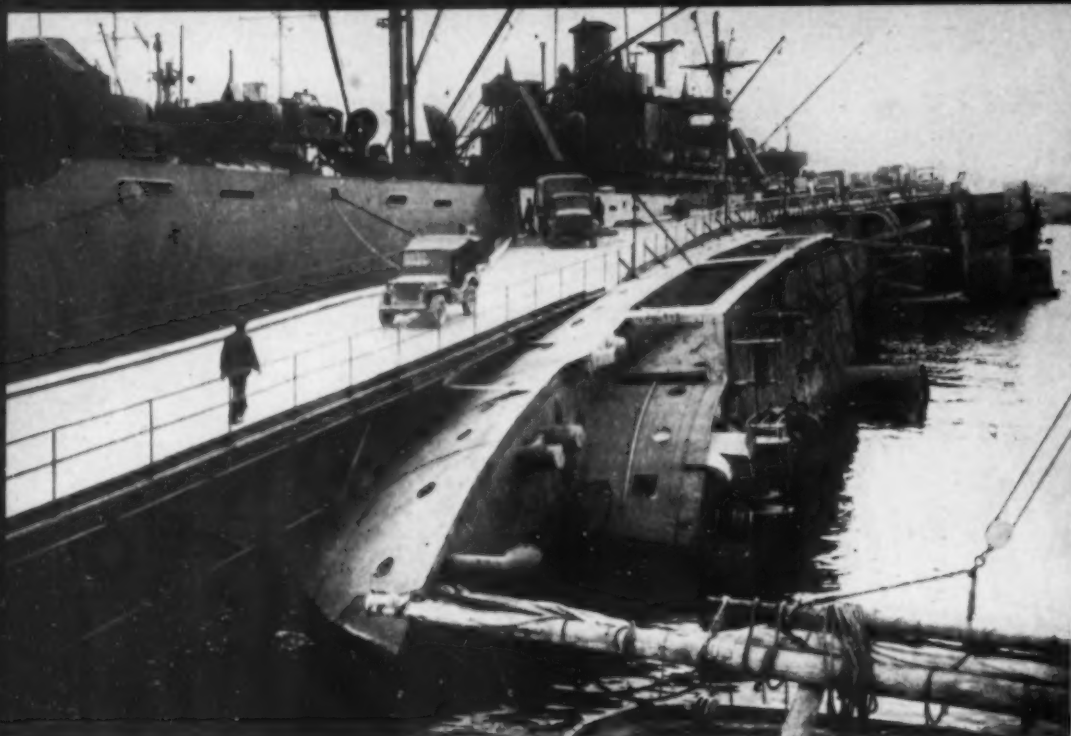
90 Tons

Transferred in Midair

Between Cranes

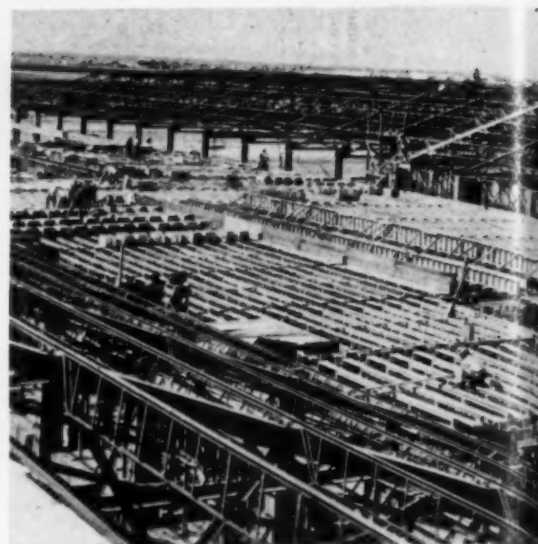
AFTER TRANSFER, cranes (below) carry deck-house on to shipway. Writing on unit is Chinese, as ship was named for famous Chinese patriot. Careful arrangement of slings was necessary to assure headroom for lifting without "two-blocking" rigging.





HULL OF OVERTURNED VESSEL supports bridge for unloading cargo from Liberty ship in Naples harbor. Pier was built on ship scuttled by Germans before leaving city, so all hatches of cargo ship can be unloaded at once.

Press Association Photo



PONTON BRIDGE (below) over Italy's Garigliano River is crossed by infantrymen of Fifth Army. Direct enemy fire made bridge building difficult for first assault troops, so light vehicles went over on pontoons and heavier ones on rafts.

British Combine Photo

THIS MONTH'S NEWS REEL

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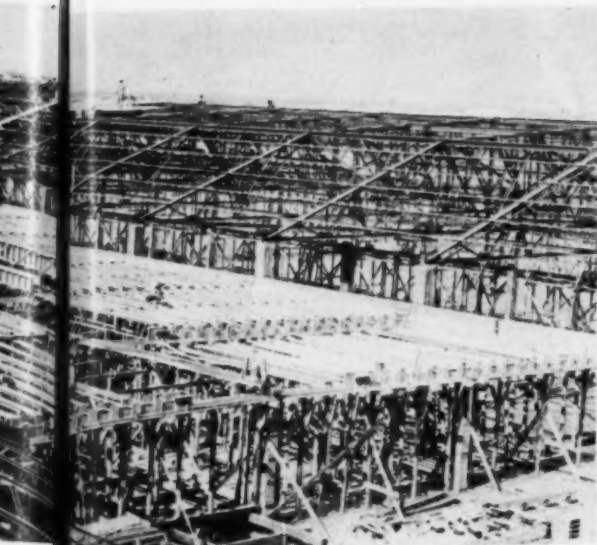
COMPLETION IN 1944 is object of round-the-clock work on Fontana Dam (below) in western North Carolina. Highest (470 ft.) dam east of Rocky Mountains, this Tennessee Valley Authority project will rise 40 ft. above level of high steel construction trestle from which hammerhead and revolving gantry cranes are placing concrete. Dam, 1,750 ft. long on its crest, will contain 2,600,000 cu. yd. of concrete.



GERMAN DEMOLITION MATERIALS (below) help British Eighth Army Engineers to replace bridge near Isernia, Italy. Charges placed by enemy sappers in pier of 180-ft. span failed to explode, leaving excellent base on which to erect new bridge, using two spans of bridging equipment. Explosive left in undemolished pier was salvaged for use in removing wreckage of old bridge.

British Combine Photo



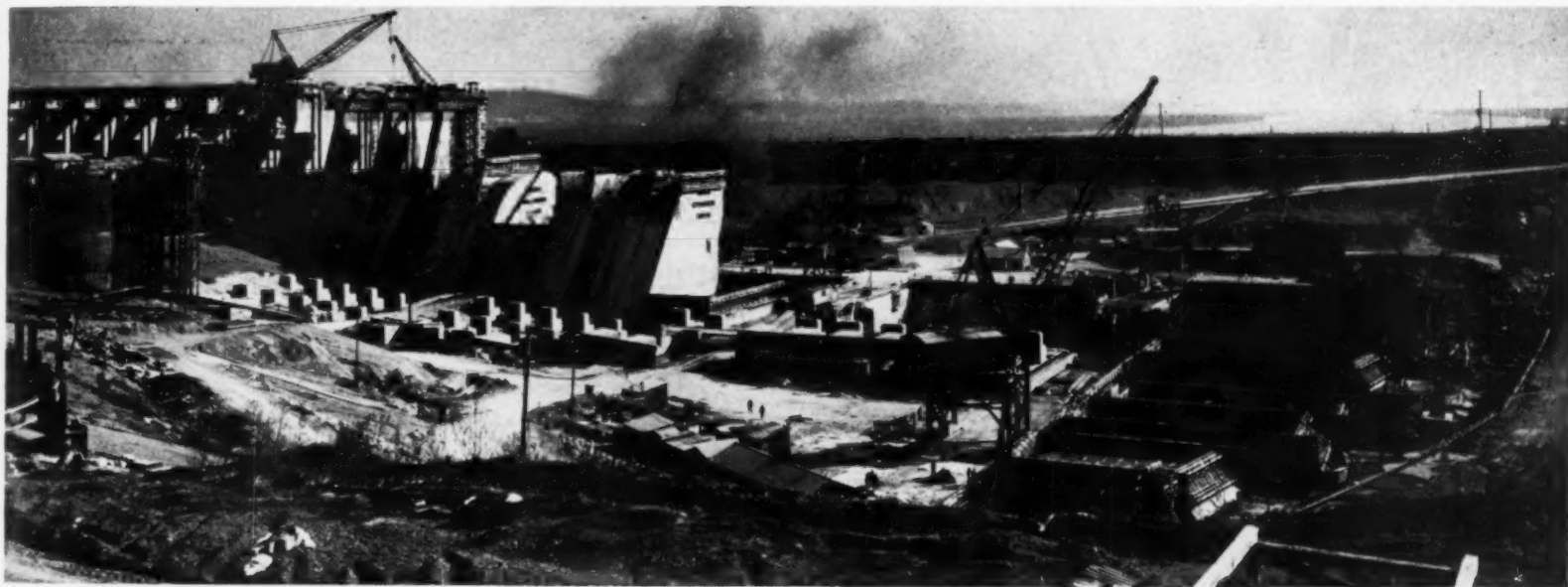


AIRPLANE MODIFICATION CENTER in Oklahoma, recently completed in 92 days by Corbetta Construction Co., of New York, for U. S. Engineer Department, provides 622,700 sq. ft. of floor space in two 160x600-ft. hangars separated by two-story



100x600-ft. shop and office building. Hangar design provides for 160-ft. steel roof trusses spaced 25 ft. on centers and supported by 18x24-in. concrete columns. Shop building is reinforced concrete structure, with 16x18-in. columns and con-

crete girders. Outer walls of both buildings are of concrete blocks. Work was carried on 24 hr. a day. Architect-engineers for project, which cost about \$4,500,000, were Sverdrup & Parcel, of St. Louis, and J. Gordon Turnbull, of Cleveland.



TVA'S KENTUCKY DAM nears completion, with work going forward at full speed to make power available for war production. Built within huge cellular cofferdams near mouth of Tennessee River, dam 160 ft. high above bedrock has total length of 8,650 ft., comprising concrete spillway section flanked by earth embankments. Kentucky dam, to cost \$95,000,000 exclusive of power installations, is largest river development project east of Mississippi River.

BRICKS LAID IN HERRINGBONE PATTERN (below) provide weatherproof runway for advanced landing field in Italy for fighters and bombers. Job is being done by British sappers.

British Combine Photo

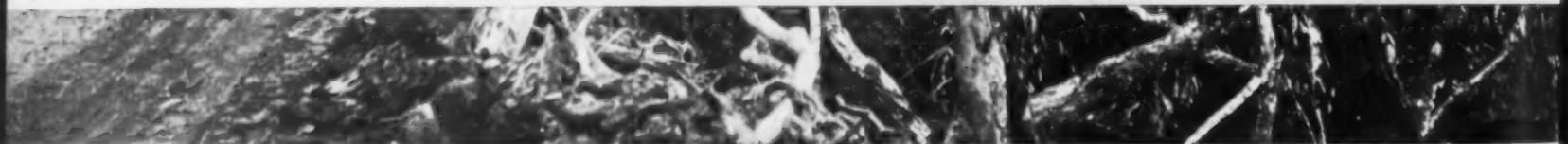
FIRST VICTORY SHIP. "S.S. United Victory," (below) joins nation's cargo-carrying fleet being built for U. S. Maritime Commission. Faster and more efficient than Liberty ship, it has speed of 15 knots or better. Built by Oregon Shipbuilding Corp., as described in April "Construction Methods," it is expected to form backbone of post-war merchant fleet. Yard has contract for 109 of these vessels.



Leda Road



How Army Engineers, Beset by Incredible Difficulties, Are Performing Construction Miracles in Building New India-China-Burma Supply Route



TRUCK TRAFFIC moves in steady stream along completed portion of Leda Road hacked through Burma jungles and crossing mountainous terrain.

Acme Photo

DIRECTING COOLIE LABORERS (below) on Leda Road in Assam, India, is Sergeant William King, member of Negro Engineer unit, wearing rubber coat and carrying his rifle with barrel down to protect bore from rain.

Press Assoc. Photo

Transmitted from Headquarters, Services of Supply, U. S. Army Forces, China-Burma-India, the accompanying description of the construction of the Leda Road has been received by "Construction Methods" from the office of the Chief of Engineers, U. S. Army, Washington, D. C.



SOMEWHERE IN INDIA. Services of Supply of U. S. Army Forces in China-Burma-India theater of operations are commanded by MAJOR GEN. W. E. R. COVELL (left) here pictured with BRIG. GEN. THOMAS F. FARRELL, commanding Construction Service in same area, which includes the Leda Road. Both officers were promoted to general rank from the Corps of Engineers. Gen. Farrell served with the Engineers in France during the first World War and is a former chief engineer of the New York State Department of Public Works. Before going overseas he was chief of the Construction Division, Office of the Chief of Engineers, Washington, D. C.

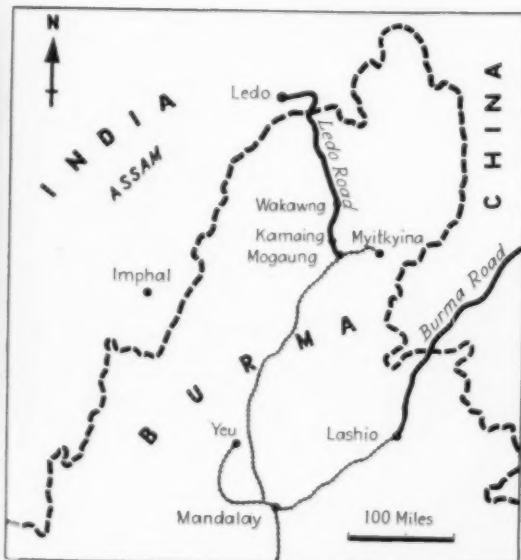


COL. LEWIS A. PICK, Corps of Engineers, is in immediate charge of the construction of the Ledo Road. A veteran of the A.E.F. in France in the first World War, he is a former division engineer of the U. S. Engineer Department's Missouri River Division, with headquarters at Omaha, Neb.

Signal Corps Photo

SOMEWHERE IN INDIA: Day and night heavy trucks thunder along the Ledo Road, which U. S. Army Engineers are building from India into Burma, carrying supplies to troops up at the front. Ahead, bulldozers are still smashing at the slowly yielding jungle, extending the path of the road toward its eventual meeting with the old Burma Road and the re-establishment of an overland supply route for hard-pressed China.

In back of the lead bulldozers are hundreds of men, masses of equipment, all engaged in the task of improving the



LEDO ROAD extends from point in province of Assam, India, southeast into Northern Burma. Map shows relative locations of Ledo Road and Burma Road.



ONE OF THE BRIDGES on the Ledo Road, built by U. S. Army Engineers. Here native laborers, working with mattocks and wicker baskets, are repairing washout near abutment caused by torrential rains during monsoon season.

Corps of Engineers Photo



MAJOR PERLEY M. LEWIS (left), former contractor of Phoenix, Ariz., has played an important part in the construction of the Ledo Road. Before going overseas he served with the U. S. Engineer Department as area engineer directing work on air base and ordnance depot construction in Nebraska.

SOMEWHERE IN ASSAM, along the Ledo Road in India, Private Lester B. Floyd, of Bowling Green, S. C., operates a Caterpillar diesel tractor-bulldozer to widen road for increased volume of traffic which route is being called upon to carry.

Corps of Engineers Photo

CONSTANT MAINTENANCE (below) is required to keep the surface of the Ledo Road in shape for carrying heavy truck traffic. Here Corporal Rufus Johnson, of Kingstreet, S. C., operates Gallion motor patrol blade grader.

Corps of Engineers Photo





NOTCH IN STEEP HILLSIDE is cut by tractor-bulldozer in Assam Province of India, as Chinese troop patrol advances with road builders.

Press Assoc. Photo



SURVEY PARTY from Army Engineer unit in Assam is operating in vicinity of bridge which is to be widened. In foreground are Corporal Joshua F. Bowden, of Clairton, Pa., and Private John R. Quay, of Chicago.

Corps of Engineers Photo

ROCK FOR ROAD BUILDING (below) is collected by Indian laborers who scour stream-bed and deliver stones in baskets to waiting Army truck, in background.

Press Assoc. Photo

road and keeping it in shape for the heavy pounding which it receives from the continuous stream of vehicles that pours over it. Big trucks are constantly slamming up into the hills in low gear, grinding their way forward into the Hukawng Valley with food, fuel, and other supplies for the road builders and for the American-trained Chinese combat troops who are fighting ahead of the road.

Maintenance a Big Problem

Keeping the road in condition for the heavy loads which it is called upon to carry is a major task for the Engineers. Primary considerations in road maintenance are keeping the surface of the road hard and crowned so that water will run off, and maintaining the ditches deep enough and low enough to drain off any water which starts to accumulate underneath the surface of the road.

The first of these, keeping the surface hard, is made more difficult by the type of rock which is available for road surfacing. The soft sandstone which is found in Assam pulverizes under the grinding weight of the trucks which are constantly on the move up and down the road. The ideal situation would allow for an addition of an inch of this rock every month, but limited personnel and equipment available for maintenance work, and limited supplies of rock in the area, cut down the amount of work of this nature that can be done.

Blade graders are always on the road



DEEP CARAVAN BOGS DOWN in deep mud of section of Ledo Road that has just been cut through jungle growth. Road building operations are beset by torrential rains during monsoon season.

Acme Photo



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MEN, EQUIPMENT AND SUPPLIES move up to point where construction is in progress on new Ledo Road, being built to provide a supply route from India, through northern Burma, to China.

Acme Photo





BOLTED CONNECTION (below) for bridge spanning stream on Ledo Road is made by wrench in hand of Private George Verschoren, of Chicago.



CONSTRUCTION CAMP deep in jungles of northern Burma provides temporary quarters for U. S. Army Engineers and their equipment, including trucks, patrol graders and bulldozers.

Acme Photo



SINUOUS ALIGNMENT of sections of Ledo Road is made necessary by rugged mountainous terrain and need for speed in opening up route to traffic at earliest possible date.

Acme Photo

scraping its surface, careful not to dislodge any of the rock foundation. Some of the men who operate these graders have made their work an exact science. They take a cut which is no more than $\frac{1}{2}$ -in. deep, just removing the loose clay which has gathered on the surface. Ruts which start to form after a rainy spell are quickly smoothed out, and new surfacing added to fill in the holes which have been left.

Holes which start to form along the road have to be patched quickly. A small hole can turn into a veritable pit as heavy truck wheels crash down into it, making it deeper and deeper. Main-

tenance crews are always on the lookout for these holes, filling them in as soon as they are found.

Drainage ditches are maintained for the most part by Indian labor crews, under American supervision. The Indians dig out the ditches with crude implements called "marmetties," which look like oversized editions of common garden hoes. Vast numbers of laborers are at the roadside daily keeping up these all important drainage ditches.

In addition to the normal maintenance work, constant road improvement is going on. Bridges which were originally

(Continued on page 151)

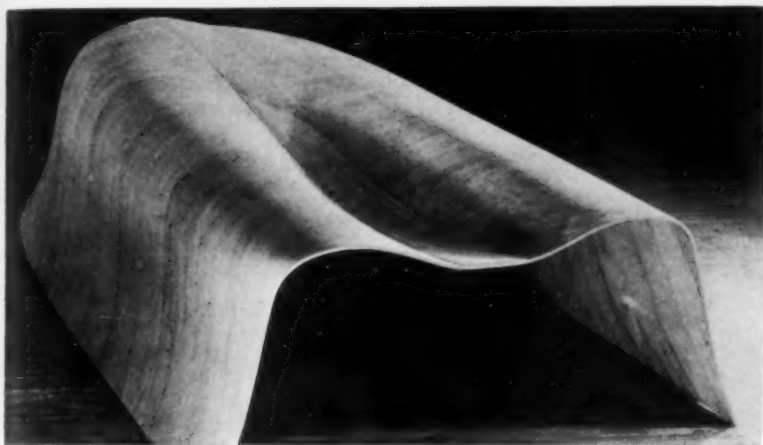
CUTTING OF EARTH BANK at approach to bridge on Ledo Road which is being widened is done with bulldozer blade on Caterpillar tractor operated by Technician, 5th Grade, Jewell N. Taylor, of Springfield, Tenn.

Corps of Engineers Photo



JOB

oddities



COMPOUND CURVED PLYWOOD forms hulls of utility power boats which U.S. Plywood Corp. is producing for Army. Hulls, 18 ft. long and 6 ft. 8 in. in maximum width, are formed of seven plies of 1/16-in. veneer molded in one piece, with two outer layers of resin-impregnated birch; there are no seams requiring calking. Bottom of each boat is contoured to protect shaft and propeller.



BALANCING EMPTY BASKETS on their heads, Nigerian natives return to mine excavation after depositing excavated overburden some distance away. These West African mines produce ore in great demand for special steels used in aircraft construction.

British Combine Photo

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100-YEAR-OLD METHODS OF CONSTRUCTION are illustrated in this drawing, by John C. Bourne, accompanying historical description by John Britton (published in 1839) of 112 1/4-mi.-long London & Birmingham Railway in England, on which work started in 1833 and was completed 5 years later. One of construction features of project was deep "tring cutting" through chalk ridge. Length of this excavation, involving removal of 1,400,000 cu. yd. of material, was 2 1/2 mi. and its average depth was 40 ft.; in one place a 60-ft. deep cut was required. Material was dug with hand tools and loaded into wheelbarrows which were raised to top of cut with aid of "horse runs" or

steep ramps, equipped with sheaves and long cables hooked on to wheelbarrows at one end and pulled at the other by horses moving along top of cut. Illustration shows series of these "horse runs" spaced along both slopes of cut, with wheelbarrow operators moving up and down ramps. "Horse runs" were not the only construction oddity involved in "tring cutting." Excavation uncovered numerous fossils, old Roman vases and tusk and teeth of elephant. Of Birmingham & London railway project Mr. Britton, its historian, wrote: "Six millions of money, at least, will be required for this single, daring commercial speculation."



Britain's Airfields

Built With Aid of

HEAVY-DUTY CONSTRUCTION EQUIPMENT

RUNWAY IS LEVELED by Le Tourneau scraper drawn by Caterpillar tractor at R. A. F. airdrome in Britain.



AIRFIELD CONSTRUCTION WING of R.A.F. extends runway by 300 yd., so it can be used by four-engined bombers. Grading is done by this Cletrac tractor-drawn scraper.

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SAND, STONE AND CEMENT (below) are shoveled into loading skip of concrete mixer. At this northeast Yorkshire airport 50 men laid 2,000 sq. yd. of concrete 6 in. thick in 12 hr.



REINFORCED WIRE MESH (below) which will serve as emergency runway for fighters and light bombers is laid by Army Airfield Construction Group for use of Canadian and British troops in training program.



AIRDROME FACILITIES now under construction or already completed in the British Isles are sufficient to meet demands of both the British and American air forces. With completion of these fields, according to British Information Services, official government bureau, airport building will have almost reached the saturation point, as there is not enough space left to increase the existing facilities by more than a fraction.

The total area of the airfields existing in Britain today is greater than the counties of London and Middlesex put together, which means that they cover approximately 225,000 acres. In fact, it is now possible to fly the 200 mi. from London to Liverpool without ever being beyond sight of not just one but four separate airdromes. Thus airfield construction can claim success in the race to keep pace with the developments this war has brought in the air. Directing the program is Air Chief Marshal Sir Christopher

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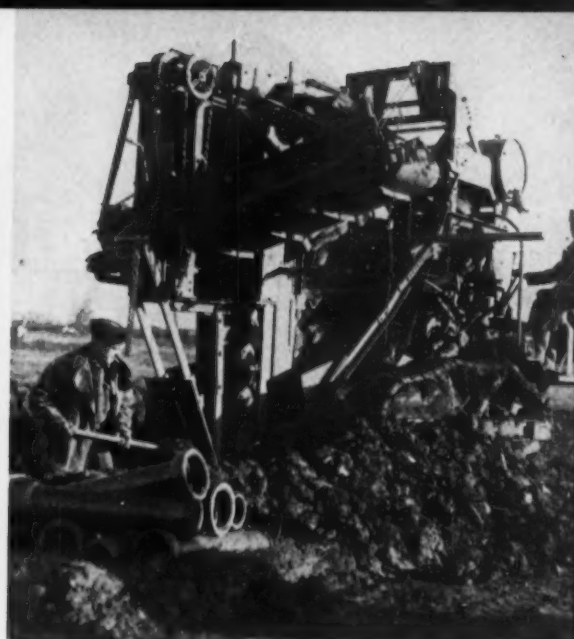
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May 194



CONCRETE IS SMOOTHED with wood screed by men of R.A.F. Works Squadron.



PIPES TO DRAIN AIRFIELD in northeast Yorkshire will be laid in trenches dug by this Barber-Greene trenching machine.

British Office

Courtney as head of the Department of the Air Member for Supply and Organization.

The U. S. Corps of Engineers has also constructed many bomber bases. Of these less than half were built by Engineer troops and the rest handled by British civilian contractors. British airdrome design prevails, since the fields must be usable by the R.A.F., with some modifications to suit the needs of our own air forces. The British furnish all materials.

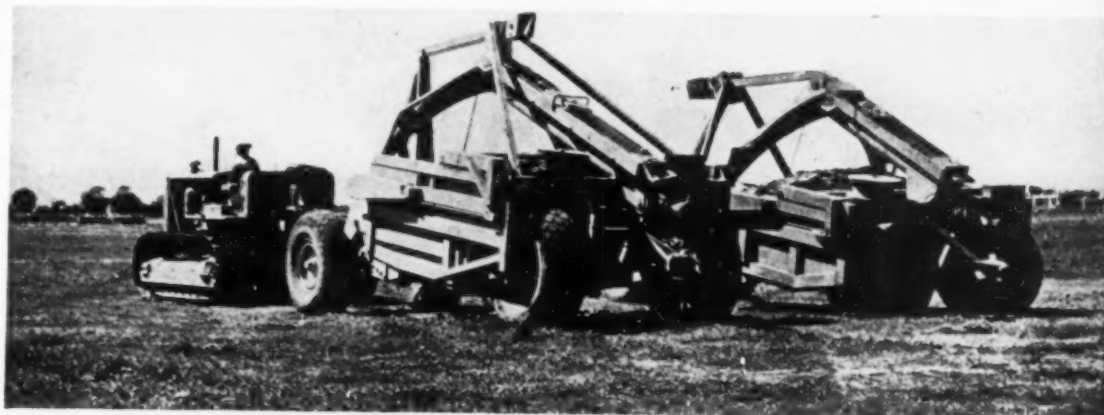
Projects include both new fields and enlargements of those already in existence. Larger and faster planes mean longer runways. The standard runway length has increased about 100 yd. for every year since 1918, when 500 to 600 yd. of fairly level grass was the normal requirement. During the next 15 years only an additional 300 yd. was tacked on, but in 1938 1,400 yd. became the standard. During 1941 this figure was raised first to 1,600 yd. and then to 2,000 yd. Today runways have been lengthened to 3,000 yd. With the exception of those serving light aircraft, all airdromes today must have runways as durable as a national highway.

Modern Airfield Layout

The modern airfield usually has three intersecting runways. The main one lies along the direction of the prevailing wind and the other two, set for varying winds, (Continued on page 160)



PORTABLE METAL RUNWAY is laid by men of Royal Engineers at North African airfield.



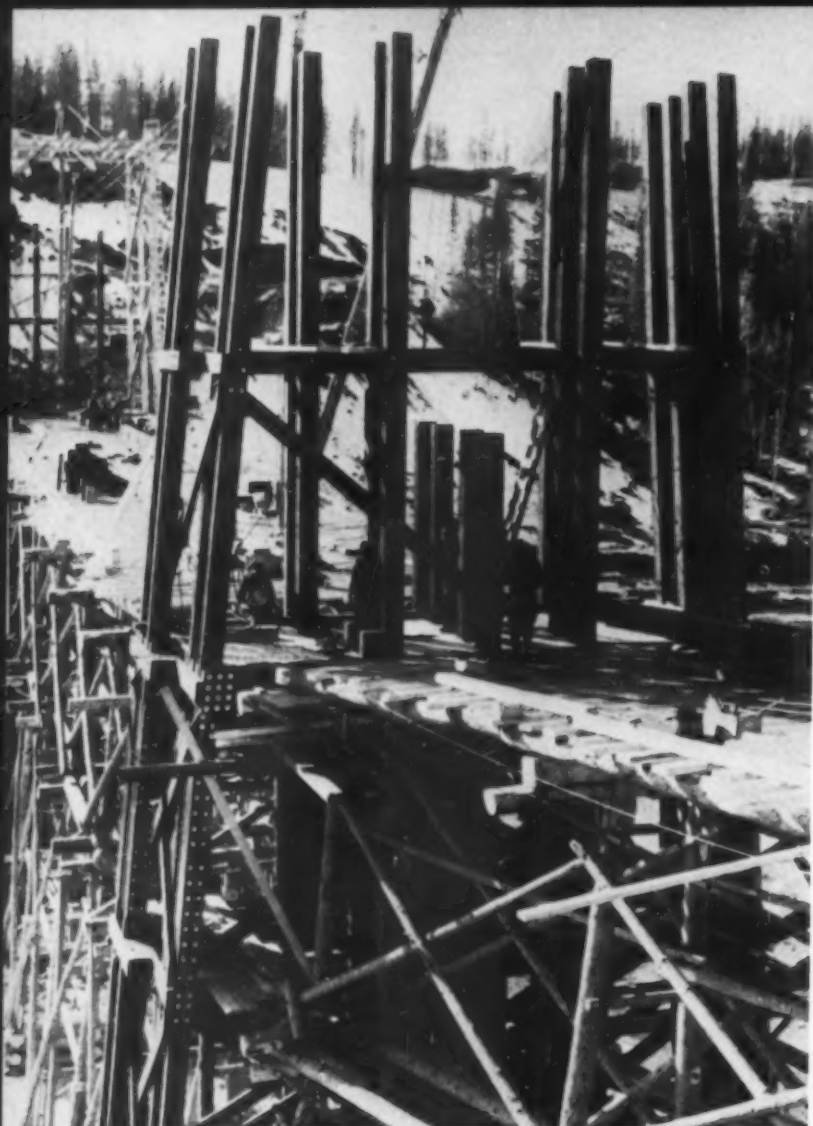
RUNWAYS PLOUGHED UP by Axis at Gabes airfield in Tunisia were repaired by British Sappers after field was captured by Allies. Here LeTourneau carryall scrapers level ground damaged by Axis efforts to make airport unserviceable.

NORTH AFRICAN AIRFIELD (right) is built for Allied Air Forces by Royal Engineers and Pioneers to bring front-line planes within striking distance of enemy-occupied territory. Roller is preparing a part of runway, while in foreground rock is broken for runway foundations. Runway has covering of coir matting, with Somerfield track laid on top. Track is composed of wire netting reinforced by steel rods spaced 9 in. apart.



Alaska Highway Bridge

of Treated Timber
Erected Despite Flow
of Ice-Laden River



MAIN SPAN FALSEWORK (left) rests on four rock filled log cribs 30 ft. wide and 20 ft. long. Sills are set adjacent to concrete piers to support bents. At ends of each crib, bent is erected for height of 30 ft.

By **R. P. AGNEW** and **J. B. KIELY**
Highway Engineer Assoc. Highway Engineer
Public Roads Administration, Washington, D. C.

A CREOSOTE-TREATED TIMBER BRIDGE, consisting of a main river deck truss span 195 ft. long with a 114-ft. deck truss span on each side, carries the Alaska Military Highway across the Kiskatinaw River, first stream crossing of major size north of the beginning of the highway at Dawson Creek, B. C. Highway align-

ment across the stream is on a 9-deg. curve to avoid heavy excavation.

Approaches consist of two timber trestle spans on the south end and three on the north end. Concrete piers support timber towers to carry the trusses and pedestals support the trestle spans, except at the ends of the bridge where pile



bents were used. The structure was designed for H-15 loading, in accordance with the 1941 specifications of the American Association of State Highway Officials. The trusses are of the Warren type, with steel gusset plates. Steel to timber connections were made with 4-in. shear plates, ring connectors; wood to wood connections were made with 4-in. Teco split-ring connectors.

Staking out of the structure commenced Sept. 5, 1942, and the bridge was complete and ready for traffic on June 12, 1943. The Don Construction Ltd., of Toronto, Ont., constructed the bridge and built approximately 3 mi. of road ending

(Continued on page 152)

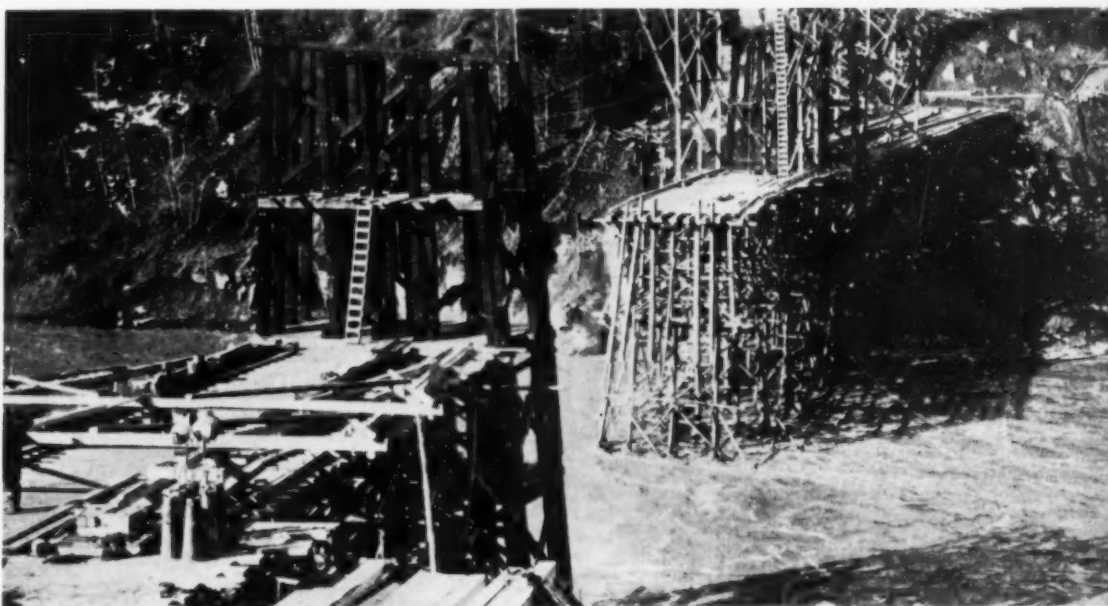


DECK OF TEMPORARY BRIDGE (left) is raised to permit water to flow under during spring break-up. This bridge was entirely destroyed by ice flow.



TIMBER TOWER (left) to carry trusses is supported by concrete pier. Pieces of timber for tower were lowered into position from falsework deck with gin pole equipped with manually operated winches.

THREE-SPAN TIMBER BRIDGE crosses Kuskatinaw River on Alaska Military Highway. Structure was built on 9-deg. curve in order to avoid heavy excavation.



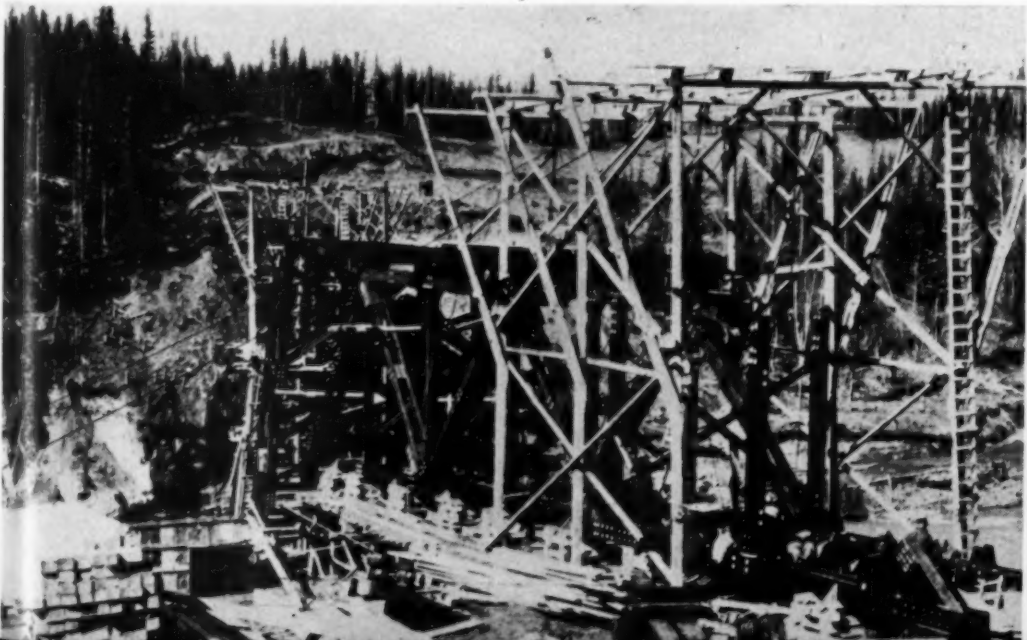
FALSEWORK is shown (left) just before spring flood and (right) after center portion was carried away by large blocks of ice. Five bents were lost.

Photos by Public Roads Administration

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SOUTH 114-FT. DECK TRUSS SPAN (below) is erected, with bents resting on sills set along hillside.

WOOD-TO-WOOD CONNECTIONS (below) are made with 4-in. Teco split-ring connectors. Here workmen are constructing gantry on north pier.



MODEL GANTRY CRANE built and used by Marinship model shop stands 6 ft. high with boom near vertical. It is valuable to riggers in developing tackle and methods of lifting.



SMALL BUT VITAL COG in the wartime job of turning out tankers for the U. S. Maritime Commission at the yard of Marinship Corp., Sausalito, Calif., is a completely equipped model shop. Although quartered in a 30x30-ft. room in the moldloft and employing a total force of only six men and women, the model shop is actually a shipyard in miniature with a complete assembly line flow from blueprint to finished product.

Using a scale of 1/2 in. to 1 ft., trained draftsmen lay out and cut templates or patterns from ship's blueprints. Scale reproductions of the actual plates and shapes that go into the ship are then traced from the templates on acetate or fiberboard and cut out in quantity. Eventually, the plates and shapes are assembled into "erection" sections which are scale replicas of the pre-fabricated sections produced in the yard's sub-assembly division. Five to twenty-five of these "erection" sections are then combined into a complete pre-hull assembly.

Assemblies are rated by yard officials as the most important items made by the model shop. They point out that the secret of modern, high speed shipbuilding is to construct larger and larger pre-hull assemblies, thus cutting down on the necessary construction time on the actual shipways. Principal limitation on the size of pre-fabricated sections is excessive weight and bulk which cannot be handled by available cranes in making the lift from skids to hull. By using the small-scale models of individual "erection" sections, engineers are able to compute the ultimate weight and size of contemplated pre-hull assemblies and determine whether they are feasible. Riggers also use the completed models of the assemblies to decide how to arrange tackle for making the necessary crane lifts.

Once the assembly is put in production, model copies are sent to the sub-assembly shop, planning engineers, and the division for use in studying individual problems. The training school also receives one of the models to be used in instructing new craftsmen who will eventually work on the assembly.

Due to the tremendous amount of detail work involved, one

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STRONGBACK (below) for lifting heavy prefabricated ship sections is rigged on miniature gantry crane.

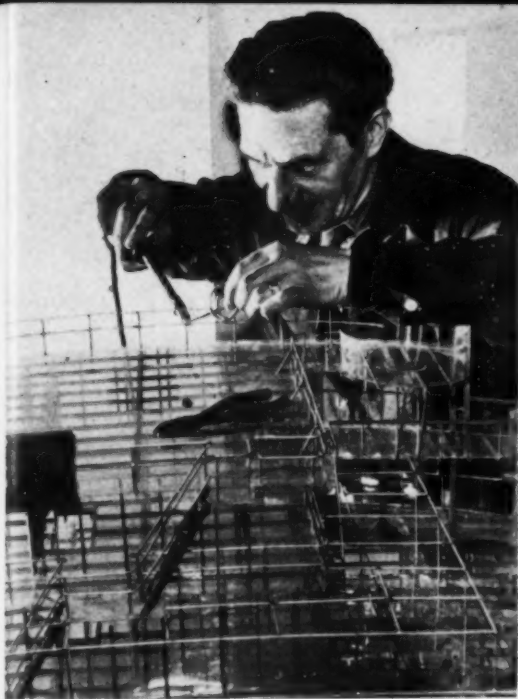


Ship Model Shop

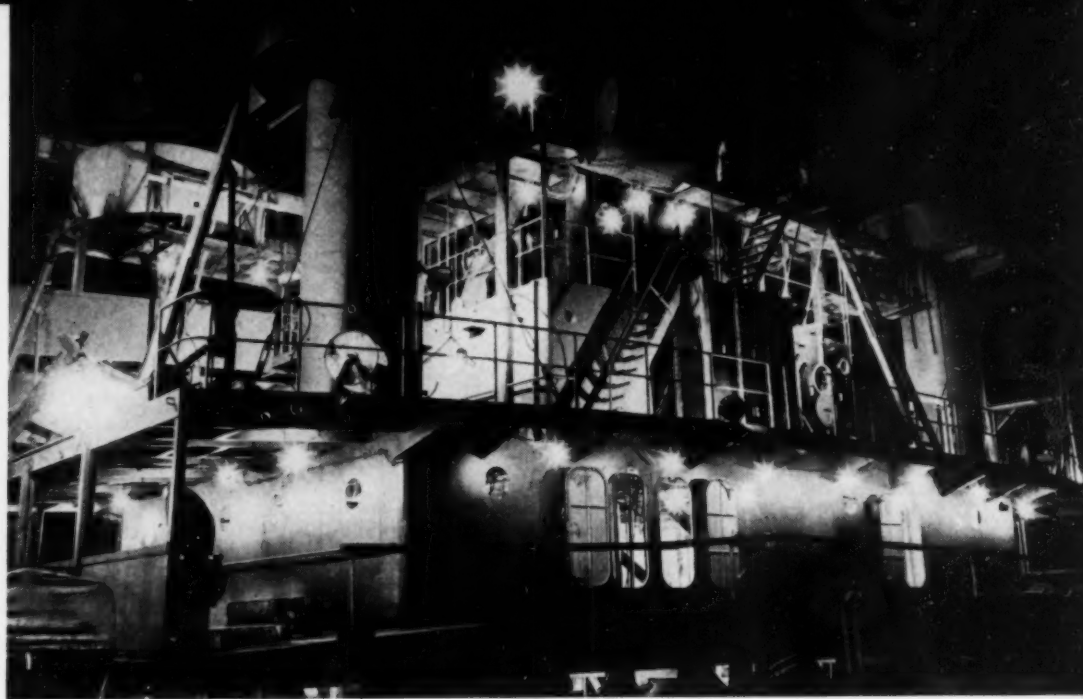
Aids Fabricators and Riggers

In Building Steel Tankers

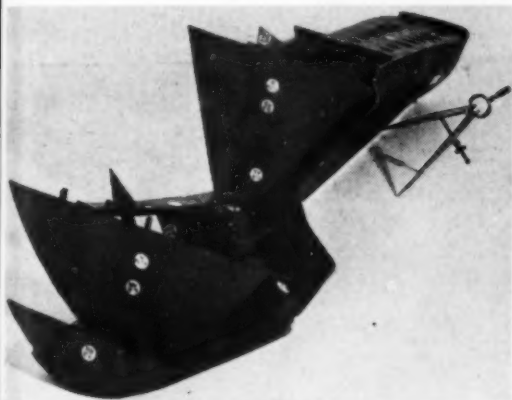
At Marinship Corp. Yards



SECTION OF PILOT HOUSE on midship deck house assembly is soldered by Argentine-born John Coletti, formerly employed on actual yard sub-assembly work.

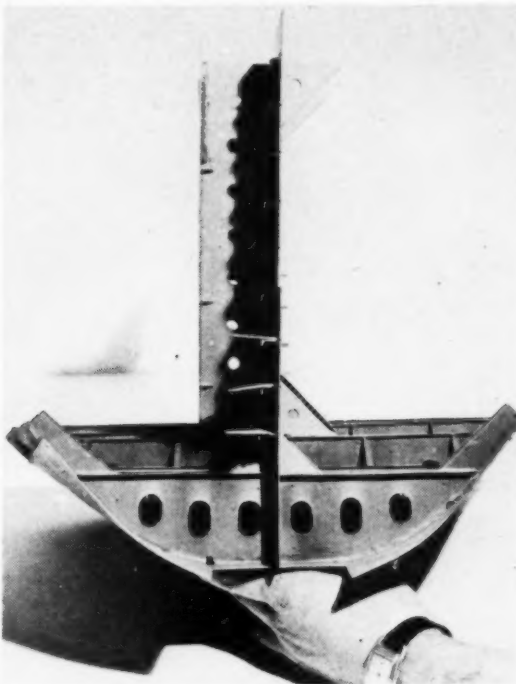


THIS 190-TON MIDSHIP DECKHOUSE was first built in model shop on scale of 1:24 before it was put into actual production. Engineers and production experts studied model and were convinced full-scale assembly could be handled. As a result, this entire deckhouse now is constructed on pre-hull assembly skids and swung on to hull in two sections, saving hundreds of man-hours of hull installation time.



COMPLETE BOW ASSEMBLY is fabricated in form of small-scale model. Every section destined for this 29-ton assembly carries identification Number H274 as it progresses down production line.

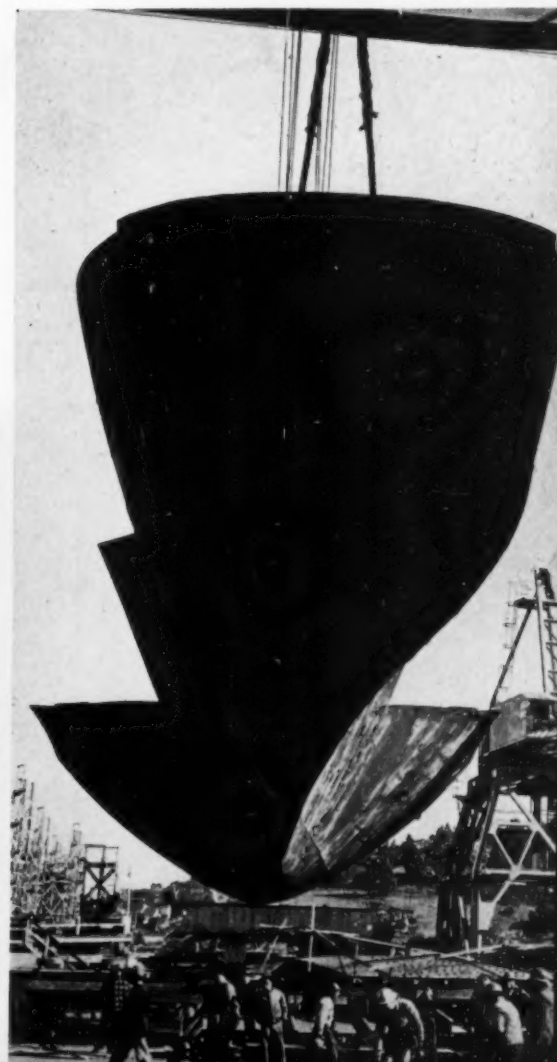
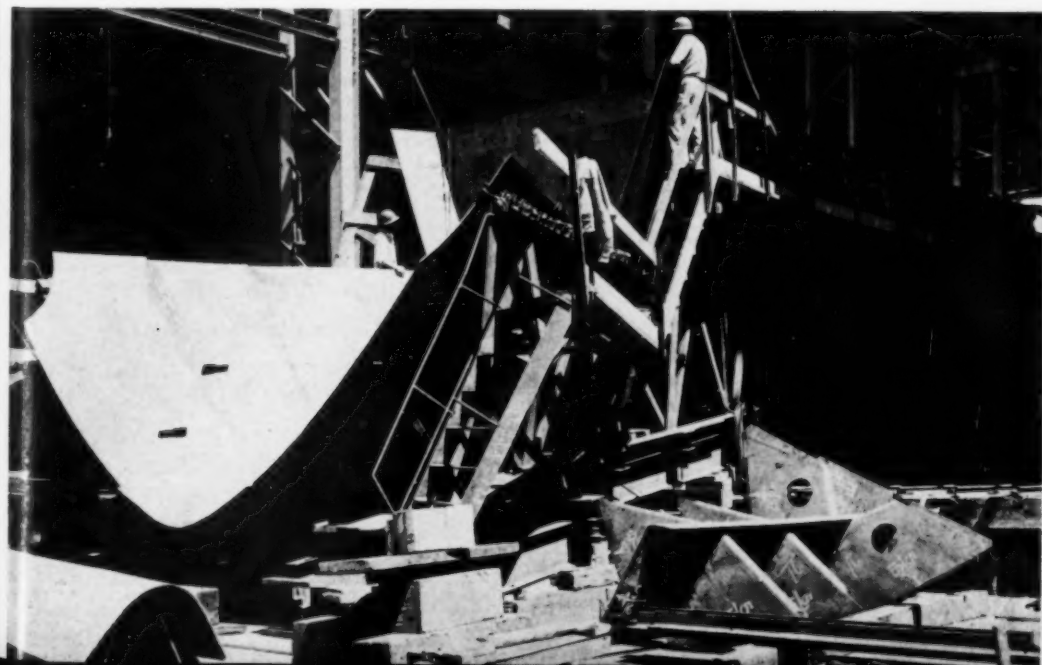
ACTUAL BOW ASSEMBLY (below) is built up on jig in sub-assembly shops. Small sections at left and right are marked for identification "H-274" and soon will take their place in final assembly. It is job of planning engineers to see that all of these small sections arrive at right place at right time to fit into this huge jig-saw puzzle.

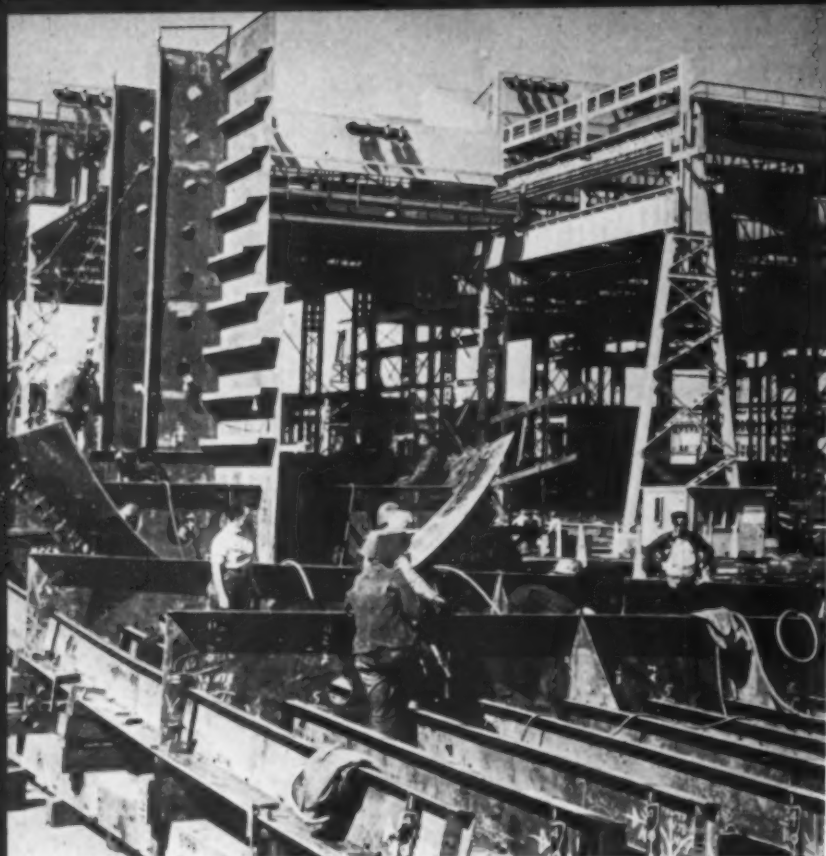


THIS MODEL (left) of double bottom and vertical bracer assembly is perfect example of how ship is built in sequence upward and outward from foundation of keel.

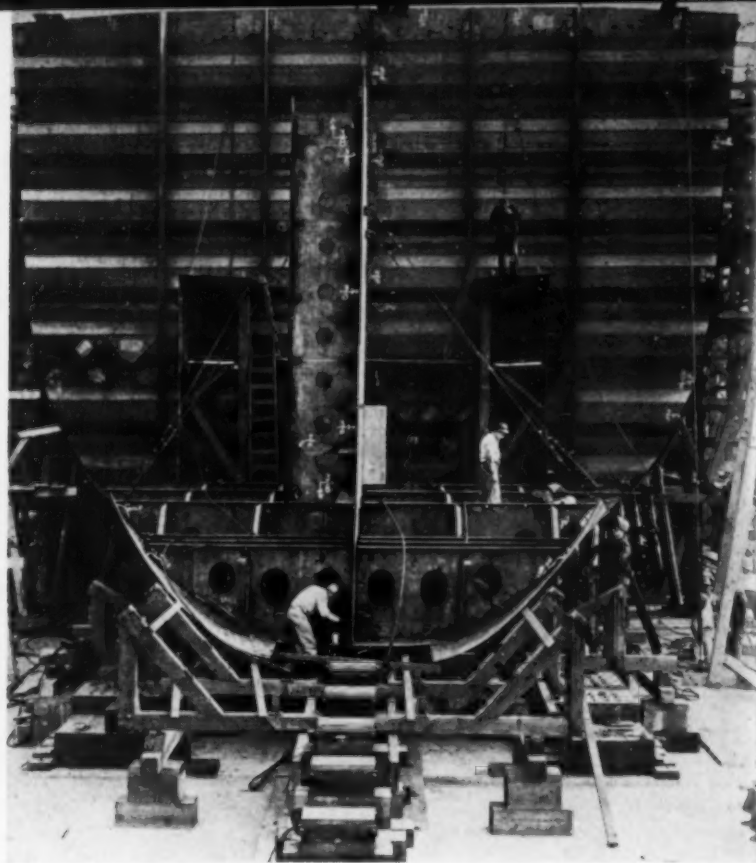
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SUB-ASSEMBLY (below) has finished its work, and riggers take over to swing 29-ton bow assembly out of shops and either into storage or on to waiting hull.





FINAL WORK is done on double bottom and vertical bracer assembly on outdoor pre-hull assembly skids. Total weight of this lift is 12 tons. Its practicability was first proved in model shop.



ERECTED ON HULL, double bottom and vertical bracer assembly takes its place against huge oil-tight transverse bulkhead. Note keel blocks in foreground, showing where flat keel of ship will be continued to bow.



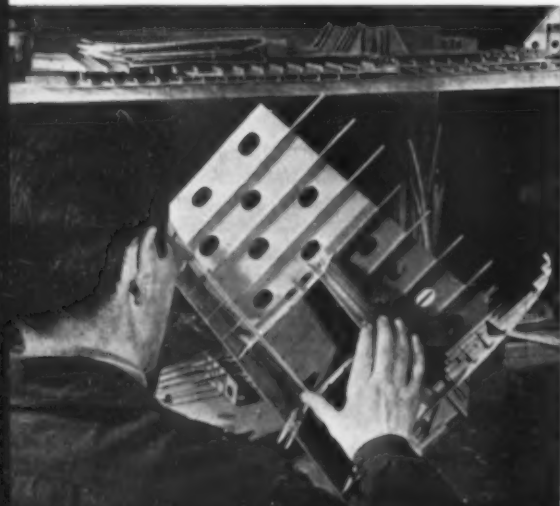
ONLY COMPLETED VESSEL turned out by Marinship model shop is this 20-ft. replica of 16,500-ton T-2 tanker. Model is made in sections which can be used independently or combined in training school courses. Note cutaway sections at stern to show craft trainees inner structure of ship.

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CHEWING GUM AND HAIRPINS (below) are definitely for amateur, but model maker John Coletti finds excellent use for good old-fashioned clothespins in fabricating this small-scale model of a contemplated pre-hull assembly.

FIBERBOARD is used by Constance Karla in fabricating model erection section of a T-2 tanker in shop.

BULKHEAD DRAWING (right) is checked by Edward Owens, superintendent of the Marinship model shop.



"It
me

THE JOB JESTER

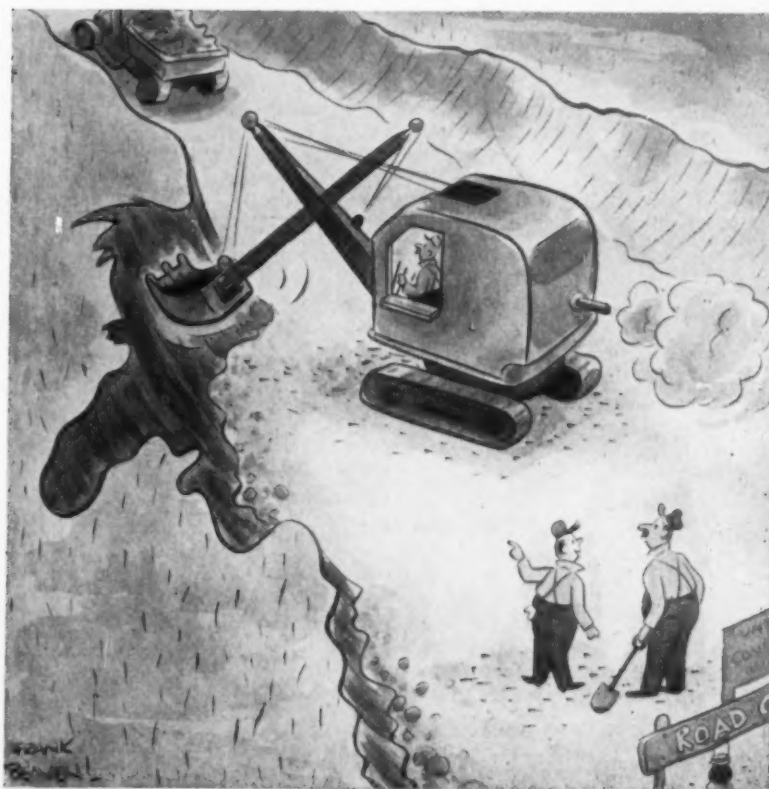
CARTOONS DRAWN FOR CONSTRUCTION METHODS



"A hell of an explosives engineer you are . . . not knowing dynamite when you see it!"



"It was specially designed by the highway department to confuse the enemy in case of invasion."



"Joe's quite a caricaturist!"

Municipal Post-War Construction



INITIATIVE AND ENERGY characteristic of all his activities mark leadership of F. T. (Tip) Brown as chairman, Citizens Post-War Construction Council. Tip Brown is district sales manager, Lehigh Portland Cement Co., Kansas City, Mo.

INTIMATE AWARENESS of the problems involved in providing future employment for demobilized service men and released war workers prompted the construction leaders of Missouri last August to invite the cooperation of the state's public-spirited citizens in forming a council to assist Missouri municipalities in clearing away all obstacles and completing all preparations for needed municipal works, in order that these projects might be let to contract at the opportune moment after the end of hostilities. A resounding response greeted the invitations sent out by the Associated General Contractors of Missouri, prime movers in the program, to state construction leaders, asking them to attend a discussion and organization meeting in Jefferson City, August 10.

Seventy prominent citizens from many localities of the state met on that date and by unanimous agreement created a going organization, directed and supported entirely by private enterprise which, up to March 15, had aided the formation of local citizens' committees to stimulate complete pre-planning of municipal post-

war improvements in 59 communities of the state. The program of the Citizens Council proposes to foster similar activity in each of 200 Missouri communities of more than 1,000 population, outside the two great centers of St. Louis and Kansas City.

This initial success in 59 municipalities represents only the first step in a continuing campaign which it now is obvious will impose a steadily increasing drain on the manpower and resources of the Citizens Post-War Construction Council. To carry on the post-war construction program in each community, the council advocates the basic plan developed by the Municipal League of Missouri, which has coordinated its post-war works activity with that of the Citizens Council. According to this basic plan, local committees representing all civic and improvement groups become the selecting and energizing agencies for promotion of post-war municipal works. Out of the mass of projects presented by various local groups, the overall committee sifts those which are most needed or most beneficial, recommends to the municipal governing body the best means of financing them, educates the public as to the desirability of the program, and brings influence to bear in obtaining passage of appropriate ordinances and action on engineering plans by public officials. Where a bond issue is required, the committee advises the municipal council as to setting a date for submitting the issue to the voters and informs the public before that date, with the cooperation of newspapers, newspaper advertisers, radio stations, billboard companies and public speakers, of the merits of the program.

Follow-Up Is Needed

Experience has shown that public enlistment of a local citizens committee, or delegation of authority by the town council to the mayor to appoint such a committee, is only the starting point on the road to action. In many communities, repeated prodding is necessary to prevent serious lags in the formation and func-

By VINCENT B. SMITH

Associate Editor, Construction Methods

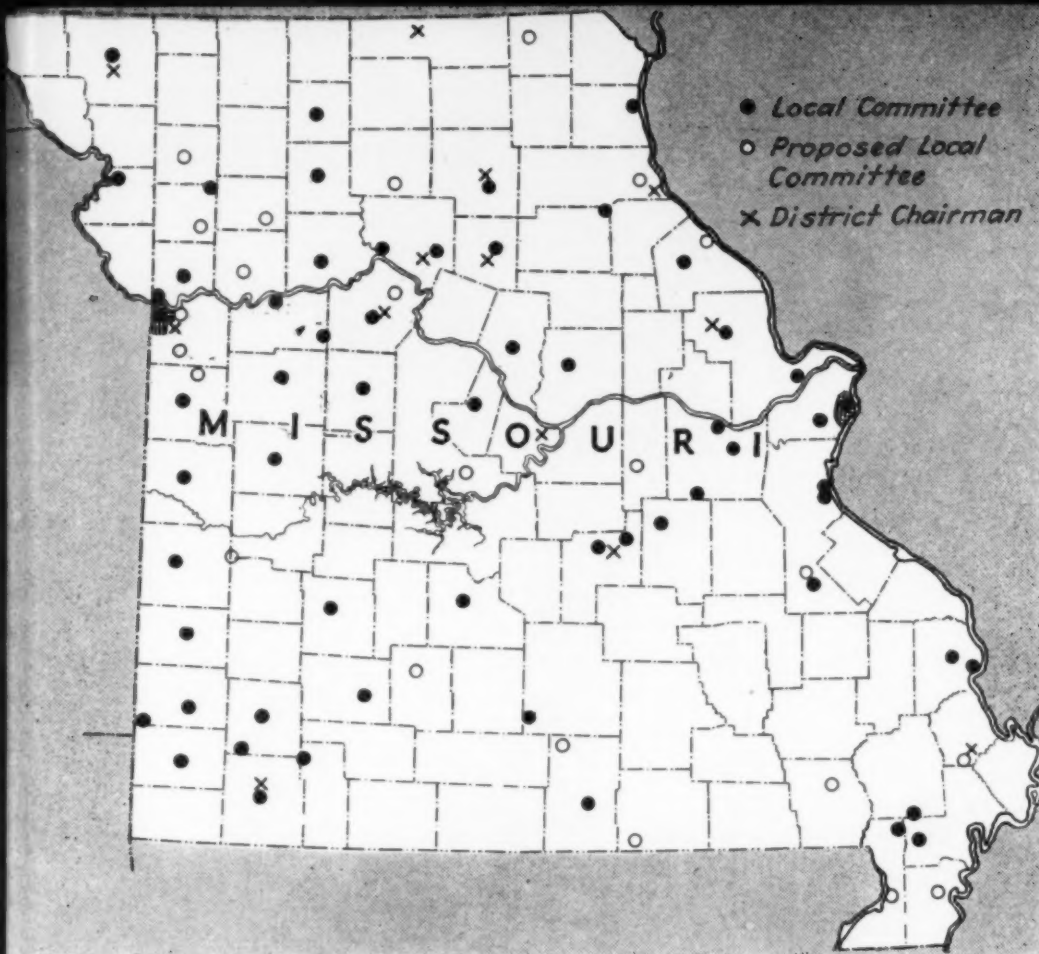
(On leave of absence to serve as executive director, Committee on Post-War Construction, American Society of Civil Engineers.)

CITIZENS POST-WAR CONSTRUCTION COUNCIL STATEMENT OF POLICY

It shall be the policy of the Citizens Post-war Construction Council:

1. To encourage making complete detailed plans, now, for the construction of public works, in order to provide employment during the emergency period immediately after the war when private industry will be reconverting to peace-time production.
2. To advocate only useful and needed projects which will add to the wealth of the community and to the prosperity and welfare of its citizens.
3. To assist in the formation of local citizens committees chosen from every business, profession, and public interest; those committees to study the needs of the community and to urge their public officials to make surveys and detailed plans, and to acquire the necessary sites and rights-of-way, so that the projects can be put under construction, and men actually put to work on very short notice, whenever an unemployment emergency arises.
4. To make a careful and comprehensive study of the laws governing public works construction, and to propose and work for any changes in those laws which will tend to lighten the burden of paying for public improvements.
5. To cooperate with all forms of private enterprise to help bring about the greatest development of our state, and to urge maximum efficiency and economy by making exclusive use of all elements of the construction industry in the performance of public works construction.
6. To earnestly and constantly persuade each community and each subdivision of the government to finance its own public construction projects and not to depend on federal financing, except in the case of greatest emergency.

September 9, 1943



SEED-BED OF ACTIVITIES for municipal post-war construction projects being cultivated by state-wide Citizens Post-War Construction Council shows progress to March 15 on this Missouri map indicating local committees at work in 59 communities and authorized in 23, with district chairmen furnishing regional service in 13 areas.

tioning of the overall committee and its important subcommittees. The plan of the Missouri Municipal League suggests three subcommittees to deal with: (1) project research; (2) ways and means of financing; and (3) public participation. A lag by any part of a local citizens committee spells delay for the program. This fact is brought home by the lack of actual blueprints for future projects even in the towns where committees have been realistically at work since last fall. With six months gone, there is little on hand of the working drawings, real estate and money which must be provided before projects can be let to contract after the war.

To overcome the normal inertia which retards progress in nearly all communi-

MISSOURI MUNICIPAL LEAGUE Suggested Outline for Local Post-War Construction Council

Citizens Council, appointed by mayor, includes representatives of every civic, church, labor, welfare, business and improvement group interested in community's future.

1. Refers project suggestions to Project Research Committee.
2. Passes upon project reports of Project Research Committee.
3. Refers projects report to Ways and Means Committee.
4. Passes upon report of Ways and Means Committee.
5. Recommends projects to governing body of municipality.

EXECUTIVE COMMITTEE
Coordinates work of entire Council

SUBCOMMITTEES

Waters and Sanitation
Water Supply
Streets and Roads
Utilities
Public Buildings
Safety and Fire Protection
Parks and Playgrounds

PROJECT RESEARCH COMMITTEE

1. Studies community needs.
2. Invites project suggestions.
3. Refers suggested projects to subcommittees for evaluation.
4. Evaluates projects.
5. Rates projects in order of priority.
6. Prepares report for submission to Council as a whole, giving for each project:
 - (a) Estimated construction cost,
 - (b) Estimated post-construction operating cost.

WAYS AND MEANS COMMITTEE

1. Makes complete study of financial structure of municipality and determines:
 - (a) What funds may be made available to finance project construction.
 - (b) Future income which may be used to defray post-construction operating costs.
2. Studies projects referred to it by Council as a whole.
3. Submits report on these projects to Council.

PUBLIC PARTICIPATION COMMITTEE

1. Keeps public informed at all time of activities of Council.
2. Encourages public to make suggestions and recommendations to the Council.
3. May include speakers' panel to supply speakers to meetings of civic groups.
4. Conducts open forums for discussions.
5. Utilizes newspapers, radio and other means of disseminating information.

ties, the state-wide Citizens Council now finds that it ought to employ five or six full-time consulting agents to travel the state and spend as much time as necessary, probably three or four days, in each laggard community. Such visits would enable the traveling consultants to talk to local leaders and provide the advice, promotional service and inspiration for a speedy advance into the essential business of making working drawings, writing specifications, acquiring sites and furnishing funds for useful public improvements, which then could be let to contract when their construction would be most beneficial to the community.

Employment of such a full-time staff of traveling agents is at present beyond



TO SPEED COMPLETE PREPARATIONS by Missouri communities for post-war construction of municipal improvements, E. C. L. (Honus) WAGNER (left) and R. R. (Rog) RINEY contribute much time and thought to their volunteer jobs as secretary-treasurer and vice chairman, respectively, of Citizens Post-War Construction Council. Wagner is secretary-manager of Associated General Contractors of Missouri, and Riney is vice president of O'Dell & Riney Construction Co., Kirkwood, Mo.

SUGGESTED YARDSTICK (left & below) of Missouri Municipal League for evaluating each proposed project requires answers to these questions: (1) Is the project essential to the well-being of the community? (2) Is it clearly in the public interest? (3) Is there a better way to accomplish similar results? (4) Can the people afford it? (5) Can the community, without serious loss, do without the project? (6) Could it profitably, or without serious loss, be deferred to a later date? (7) For how many years will it be useful? (8) Will the original investment be retired within that period? (9) Is its cost in line with its usefulness? (10) How should its construction be financed? (11) How ought, or can, the operating post-construction cost be provided?

FIELD REPORT
CITIZENS POSTWAR CONSTRUCTION COUNCIL

Town _____ Date _____

1. Is there any kind of Postwar Construction Council in this town? _____

2. Name of same _____ Chairman _____

Address _____ What is his business? _____

REMARKS:

3. Give name, address and business connection of parties whom you interviewed. What is their attitude? Shall CPCC information be sent to them? Who can take the lead in this town?

Signed _____

Title & Firm _____

Address _____

REPORT OF PROGRESS
CITIZENS POSTWAR CONSTRUCTION COUNCIL
Hotel Governor Building Jefferson City, Missouri

Name of City _____ Date _____

1. Do you have a committee working on plans for postwar employment? _____

2. Name of that organization _____

3. Chairman _____ Address _____

4. If no such committee, can one be started? _____

5. Have preliminary plans been made for any public works projects? What are they and what is the approximate cost? _____

6. Do you have completed plans (blue prints) for any projects? List those projects and give approximate cost. _____

7. How much bonding power does your city have at this time? _____

8. Can the Citizens Postwar Construction Council help you? _____

Signed _____

Title _____

Address _____

the means of the Citizens Council, which is supported entirely by voluntary contributions of money and time. The men who work for the council are volunteers; they pay their own expenses and receive not a cent in compensation. It is hoped that some plan may be worked out

whereby the state through one of its departments, such as the Bureau of Resources and Development, might employ a squad of traveling agents to work under the direction of the Citizens Post-War Construction Council. Under such a plan, it would be possible to continue the

good work already begun, utilizing the momentum already developed and the intimate knowledge already gained.

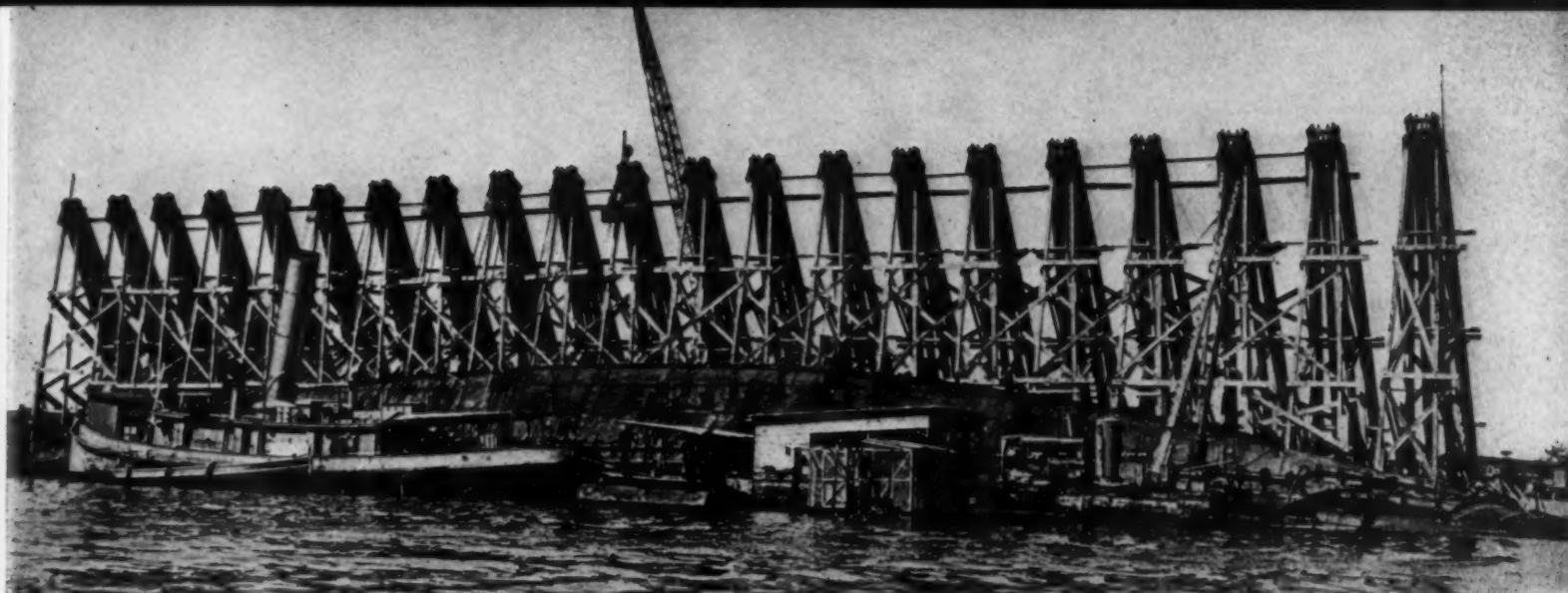
Recital of the current pressing need for increased service to the state's municipalities is in no sense a reflection upon the substantial work already accomplished by the council. The council set for itself a program of unselfish service to the promotion of a prosperous Missouri after the war, and it has held unwaveringly to that purpose. It aims to do for municipal public works what other groups of private citizens, such as the Committee for Economic Development on a national scale, are striving to accomplish: Provide a high level of employment and income within which service men and war workers may find jobs affording the incentives and opportunity associated with the free enterprise system. Public works were selected as the field of action by the Citizens Post-War Construction Council because they are responsive to action by citizens groups; the field was narrowed to municipal and county works because projects in those divisions of government are the most difficult to blueprint and finance in advance.

Representations to the United States Congress and to the Missouri legislature for action on national and state public works are left to other organizations well equipped to present the facts. For a similar reason, the Council does not seek to operate in the two large cities of St. Louis and Kansas City, where able, ac-

(Continued on page 132)



CHAMBER OF COMMERCE DINNER attended by 150 members and guests at Moberly, Mo., hears stirring speech by E. C. L. WAGNER on necessity of making detailed plans and providing funds now for municipal post-war construction projects on which returned servicemen may find useful employment. Moberly, a city of 13,000, has an active planning commission, created by the city council and appointed by Mayor Martin J. Kehoe, which is developing post-war construction plans under leadership of Henry A. Taylor, chairman, with aid of Proctor Peirce as engineer consultant on volunteer basis.

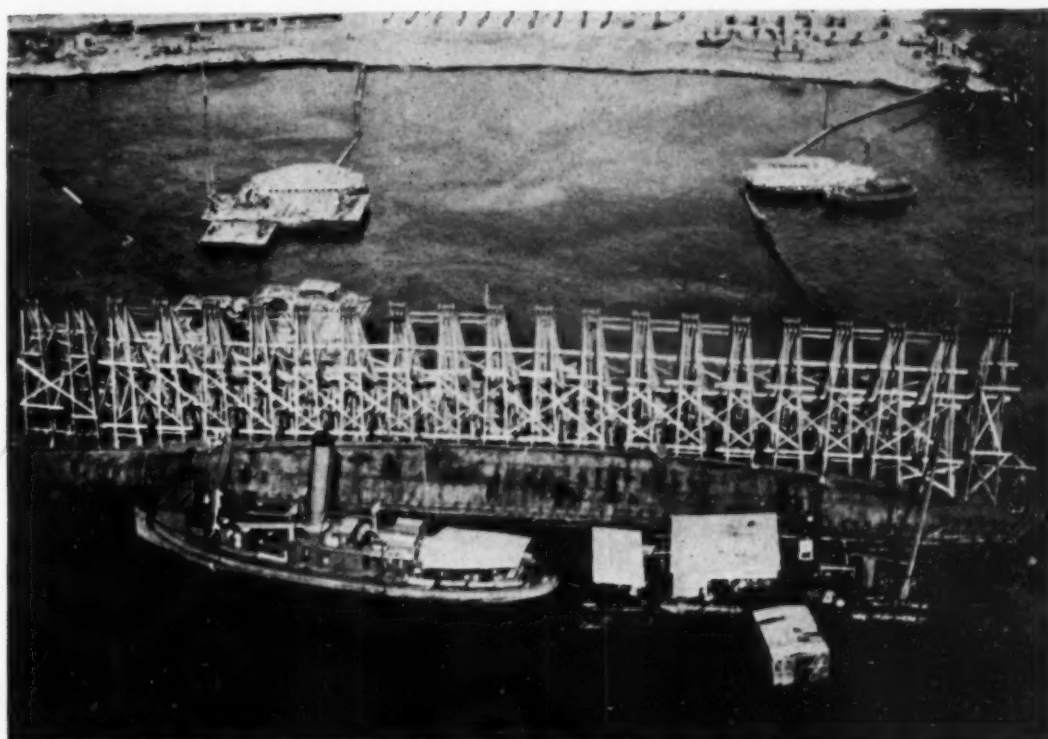


MOUNTED ON BILGE KEEL of "U.S.S. Oklahoma" are 21 timber A-frames to which compound pulleys are attached. Large cables, reeved through pulleys, run to 21 winches on shore.

Power-Driven Winches and A-Frames

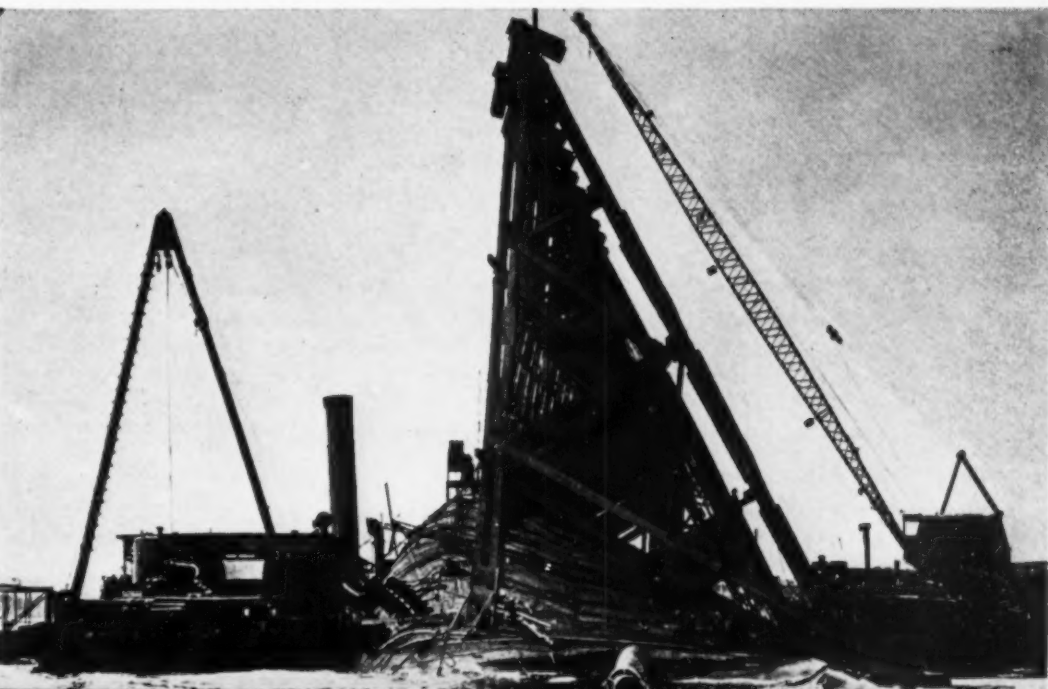
HELP RIGHT

U. S. S. OKLAHOMA



RIGHTING OF BATTLESHIP begins as cables rigged across giant A-frames are attached to ship and drawn tight by winches on shore to pull hull up-right. Cables later served to hold ship in position during salvage operations.

SALVAGE GEAR (below) is in place to raise "Oklahoma" from position bottomside up in Pearl Harbor, where she was sunk by Jap attack. Winches to which cables were attached are shown mounted on foundations on shore in background.



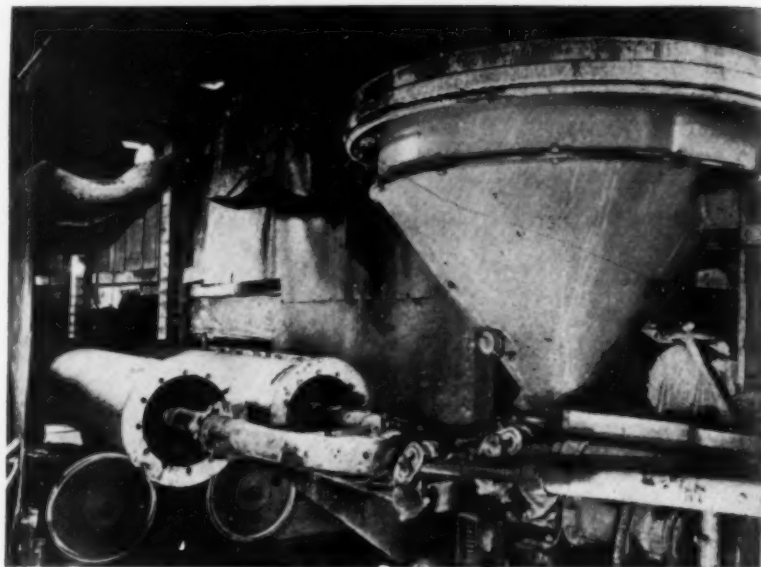
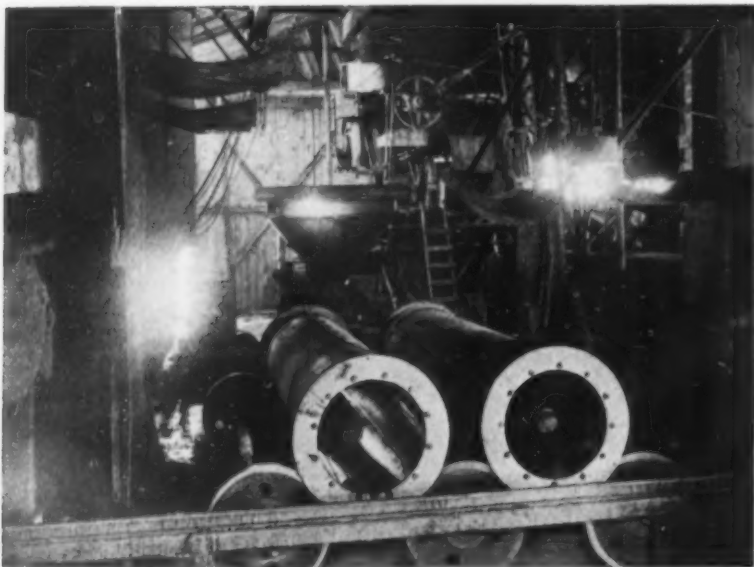
BEHIND THE NAVY ANNOUNCEMENT that the 30,000-ton U.S.S. *Oklahoma*, sunk during the Jap sneak attack at Pearl Harbor, would soon rejoin Uncle Sam's fighting ships, is an untold story of engineering achievement and all-out cooperative effort and ingenuity in procuring and adapting available equipment to get this important salvage job underway. Under the direction of the Navy and the Pacific Bridge Co., the *Oklahoma* was taken from a list of 151 deg. to within 2½ deg. of its natural position in little more than 72 operating hr. The job utilized 21 shore-anchored winches powered by General Electric variable-voltage drives, which were assembled and adapted to the application at G. E.'s San Francisco service shop.

To start this massive yet delicate raising operation, the Pacific Bridge Co. resorted to the principle of the "compound pulley." Compound pulleys were attached to 21 huge timber A-frames mounted along the bilge keel of the *Oklahoma* to distribute stresses and to provide the necessary turning movement. Large cables, reeved through the compound pulleys, ran to 21 winches on the shore.

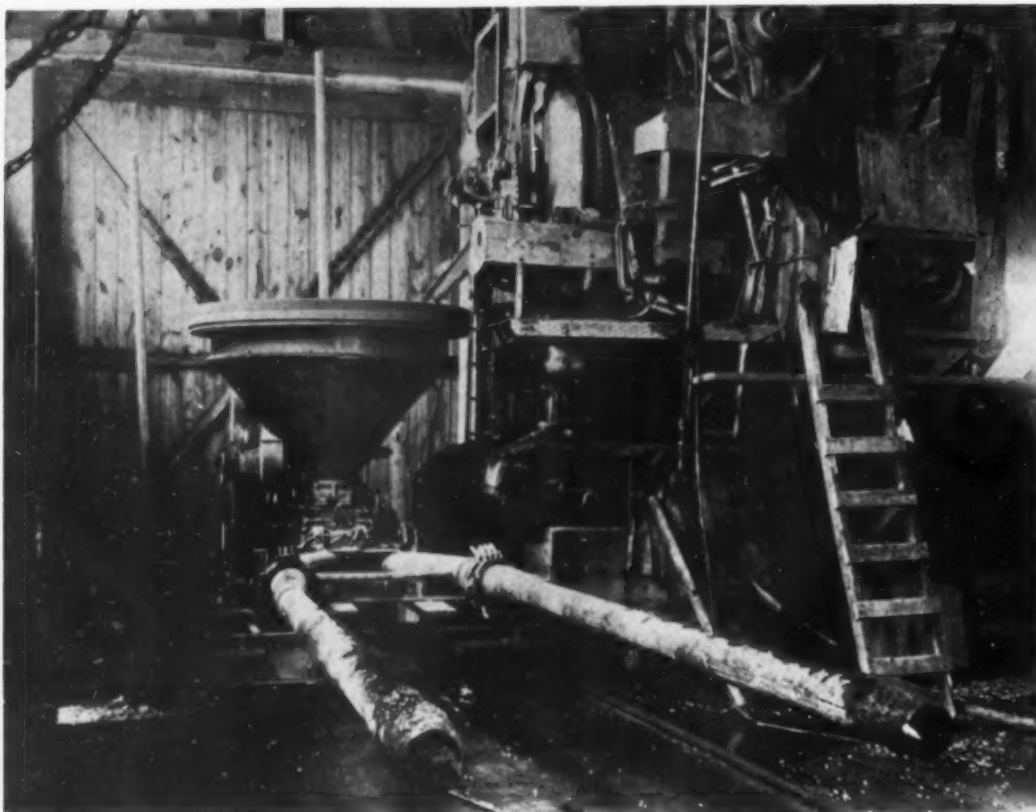
Each of the variable-voltage drives
(Continued on page 130)

Pumped Concrete

REPLACES HAND SHOVELING IN FEEDING ROTATING FORMS FOR PRESTRESSED PIPE



FRONT AND REAR ENDS of pair of pipe forms in place on rolls that rotate them during centrifugal casting process. At left are shown within pipe forms, ends of twin 5-in.-dia. discharge pipes from Pumpcrete machine in background. At right, twin discharge pipes are closely connected with Pumpcrete unit below hopper which feeds concrete into cylinder of machine.



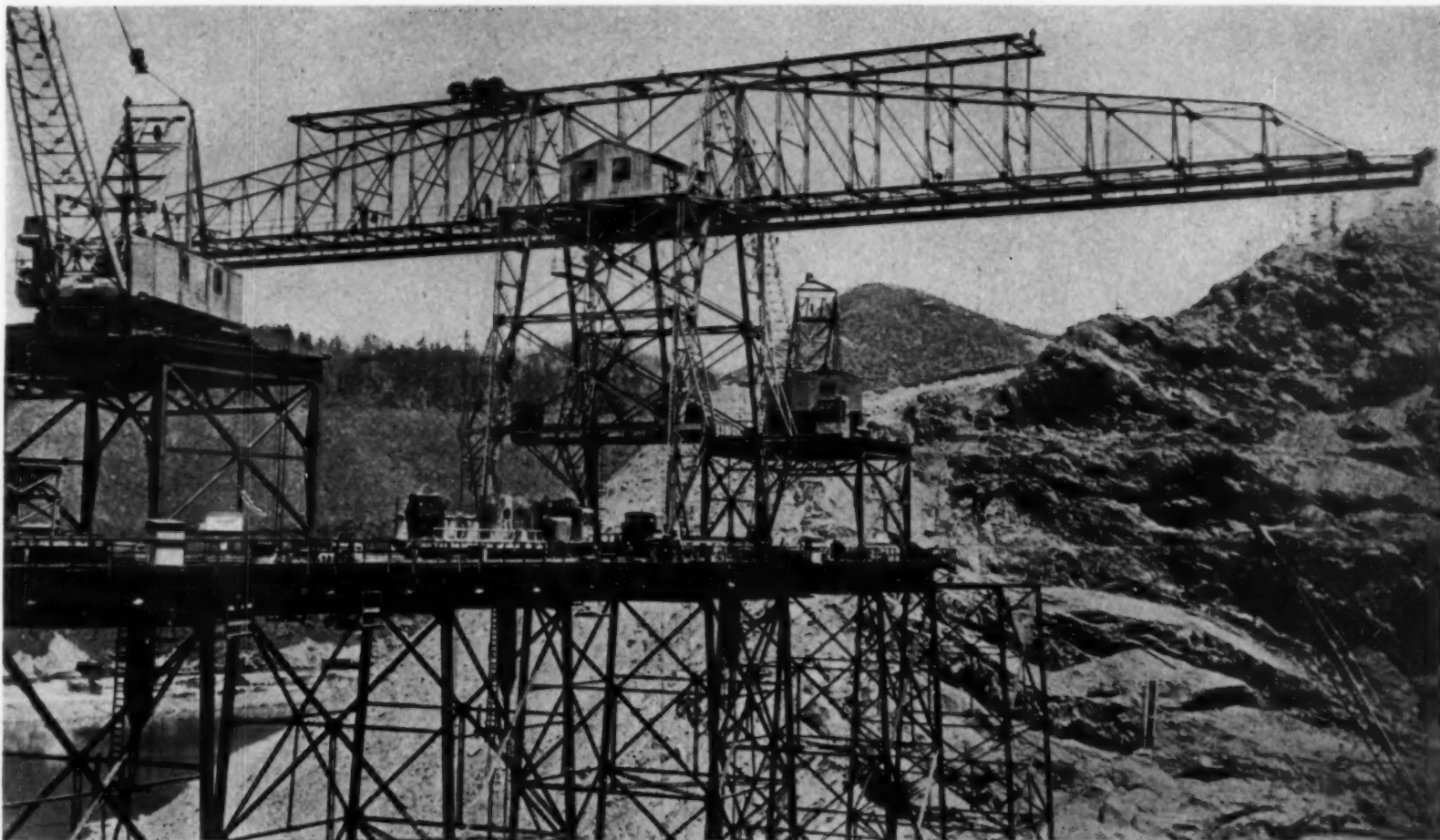
TRAVELING CARRIAGE carries Pumpcrete and its horizontal twin discharge pipes that feed concrete into rotating pipe forms. Length of travel is sufficient to cover 12-ft. length of pipe. In background is 21E paving mixer that feeds hopper of concrete pump.

BY SUBSTITUTING MECHANICAL PUMPING for hand-shoveling methods of feeding concrete into rapidly rotating forms for the manufacture of prestressed pipe in sizes from 12 to 60 in., I.D., the Lewistown Pipe Co., of Chicago, has doubled output with one-half the labor force formerly used. The pipe, designed for internal pressures up to 200 lb. per sq. in., is made by first casting a concrete shell, in which longitudinal stress rods are incorporated, by the centrifugal process. After a period of steam curing, the shell is rotated in a special winding machine which wraps its outer surface spirally with high strength steel wire, applied under tension. In a third and final operation a 1-in. protective coating of mortar is molded over the wire-bound shell.

High Test Concrete

Concrete for the high-test, spun shell is of unusual design, with 12 bags of standard Portland cement per cu. yd. combined with crushed limestone and natural sand. One hundred percent of the coarse aggregate passes a 1-in. screen, with 67 percent of the combined aggregates passing a $\frac{3}{8}$ -in. screen. The use of coarse ground cement facilitates the removal of excess water in the spinning

(Continued on page 142)



CANTILEVER CRANE equipped with new electric-hoist drive is used for handling concrete buckets from tall steel trestle in construction of Fontana Dam.

A NEW ELECTRIC HOIST DRIVE for cranes, the important feature of which is an exciter embodying a cross-flux principle, was described in a paper presented at a recent A.I.E.E. meeting in New York by M. A. Whiting, Industrial Engineering Division, General Electric Co. The new drive system not only automatically "weighs" the load so that it is hoisted and lowered at the maximum safe speed, but also prevents the handling of dangerous overloads. Safety features inherent in the fields and circuits of the system enable it to provide this degree of control without the use of mechanical relays or similar devices. Although the new system is not designed for use in all types of hoists, Mr. Whiting pointed out that it has already been successfully applied to two high-speed, high-lift hammerhead cranes at the TVA Fontana Dam, near Fontana, N. C., which place concrete at the rate of almost 8 tons a minute.

The equipment consists of a generator, a cross-flux exciter, and an ordinary constant-voltage exciter driven by an induction motor, or if preferred, by a synchronous or a d.c. motor. The hoist motor is of the type which is standard for high-speed crane-hoist installations, except that it has a non-standard main field for a variable separate excitation.

The cross-flux exciter, the speaker emphasized, is really the brain of the drive system. This exciter is designed and connected to the system so that an increase in load on the hoist, either motoring as

New Electric Hoist Drive

Operates Big Cranes For Placing Concrete In TVA's Fontana Dam

in hoisting, or regenerative as in lowering, reacts on the field of the exciter, causing it to strengthen the hoist motor field and simultaneously weaken the generator field, the degree depending on the magnitude of the load.

Since the generator supplies the power to the hoist motor armature, weakening the generator field reduces the voltage

impressed on the hoist motor armature and reduces its speed. Also, strengthening the hoist motor field further reduces the motor speed. In addition, strengthening the motor field corrects the ill effect of armature reaction and prevents any trend toward instability. A decrease in hoist motor load, either hoisting or lowering, has the opposite effect, thereby increasing the speed of the hoist motor. In this case, however, there is no necessity for armature reaction correction since the decreasing load automatically reduces its effect.

This effect from the cross-flux exciter, Mr. Whiting continued, is partly brought about by energizing one of its fields by series turns through which the current in the hoist motor armature flows. Since this current flows in the same direction whether motoring or regenerating, remembering that rotation reverses, the effect on the hoist motor field and the generator field is the same in both cases, as it should be. The method of interconnecting the motor field, the generator, and the cross-flux exciter armature is also important in producing these effects.

The two hammerhead or cantilever gantry cranes operating on a tall steel trestle at the Fontana Dam installation are controlled by this drive system. These cranes have a maximum lift of 295 ft., and at the extreme outward travel of the rack, or the trolley motion, the overhang of the hoisting hook at the end of either cantilever is 128 ft. beyond the supporting tower. These cranes are used at times
(Continued on page 150)

Desert Airbase

COMPLETED IN FIVE WEEKS



DUST STORMS shown here during laying of concrete on apron, were severe handicap to project. Natural dust storms of desert country were supplemented by dust from earth-moving activities and increased hazards of operations.



WORKING AS A TEAM (below) on concrete apron, two $1\frac{1}{2}$ -cu. yd. mixers pour into 25-ft.-wide lane. Ten pavers, working steadily, put down about 4,000 cu. yd. of concrete every 24 hr.



OVERCOMING HANDICAPS of labor scarcity, dust storms and transportation difficulties, a group of western constructors, comprising 6 prime contractors and 22 subcontractors, under U.S. Engineer Department supervision, completed work at a bombing and gunnery range at a desert site in Nevada, in the record time of five weeks. The \$8,000,000 project included extension of two existing airplane runways in which about 67,000 sq. yd. of new asphaltic paving was required, a 600x5,200-ft. concrete apron, 10,000 ft. of taxiways, about 140 military buildings of all types and sizes, a 14-mi., 8-in. water supply pipeline, a 2,000,000-gal. water storage reservoir, and a complete sewage disposal system.

Transportation problems were severe, due to the base's isolated location on the Nevada desert, more than 200 mi. from the nearest city of any size. Railroad facilities were very limited, so the bulk of

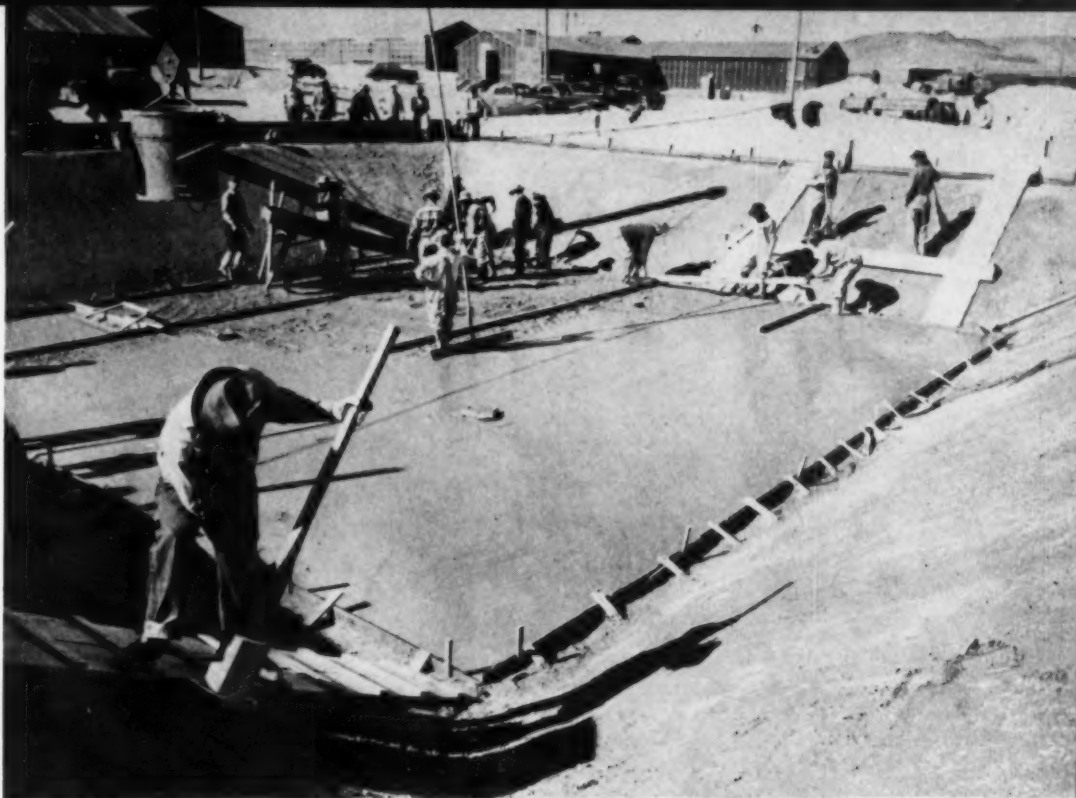
the supplies had to be brought by truck. The closest source of an adequate water supply was 14 mi. from the job site, so the pipeline had to be laid before operations began. Labor was difficult to obtain and harder to keep. Because of Nevada's sparse population, most of the men were hired in cities along the coast and transported to the job by the Army Engineers. Because of cold, wind, dust and snow, labor turnover was very heavy and frequently threatened the success of the job. No single contractor had all the equipment required. It was necessary to pool equipment and to sublet.

Joint Paving Contract

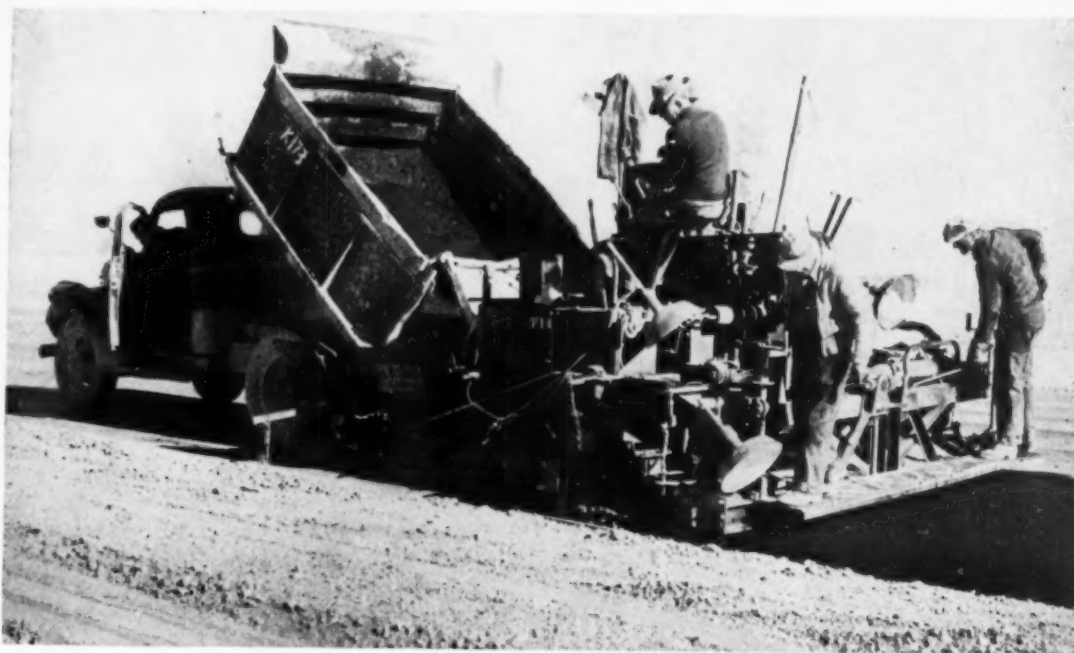
The concrete paving was a joint venture in which J. A. Casson Co., of Hayward, Calif., and N. M. Ball Sons, of Berkeley, combined in order to pour the required yardage within the contract time of 30 days. The major portion of this item was in the parking apron, but concrete base was also specified for the warming-up aprons, as well as the intersections and turning points on the runways. Sometimes concrete mixers were working a mile apart. A total of 111,406 cu. yd. of concrete, in 9-in. slab, was poured in a period of 27 days, maintaining an average of 4,000 cu. yd. per day. In one 24-hr. period 6,890 cu. yd. was placed. Total cost of paving exceeded \$4,000,000.

Paving Equipment

Equipment used in paving operations included ten 1½-cu. yd. concrete pavers, 14 power shovels, 4 draglines, 67 pieces of earth-moving equipment such as tractors, bulldozers, carryall scrapers and power graders, 35 water wagons, 100 concrete batching trucks, 25 portable lighting plants, seven crushing plants and six concrete batching plants. An average of 1,200 men were employed on the job, with an average labor turnover of 100 men per day. The work was carried on seven days a week, with two 11-hr. shifts a day. Supervisory personnel included Stanley A. Ball, project manager; L. G. Crowe, general superintendent; R. H. "Dutch" Hapgood, concrete superinten-



CONCRETE IS FINISHED for 134,000-gal. reinforced concrete reservoir to store reserve water for fire fighting.



HOT PLANT-MIX SURFACING is laid on runway by paving machine.

Photos by Sacramento District Engineer Office

FOUR SETS OF CRUSHERS AND SCREENING PLANTS (below) are at work in gravel pit.





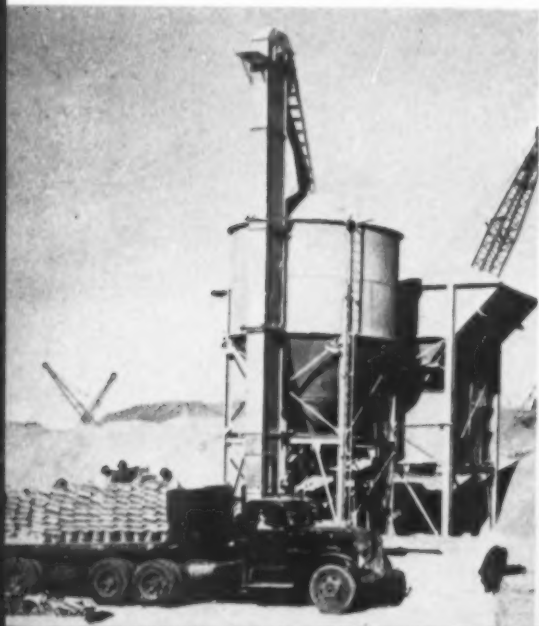
ENTIRE SUPPLY OF AGGREGATE for concrete was obtained from pits developed in immediate vicinity of job, as most of surrounding country is composed of deep alluvial gravel fill underlying shallow covering of top soil. Gravel pit is shown here, with pair of crushing and screening plants in foreground.



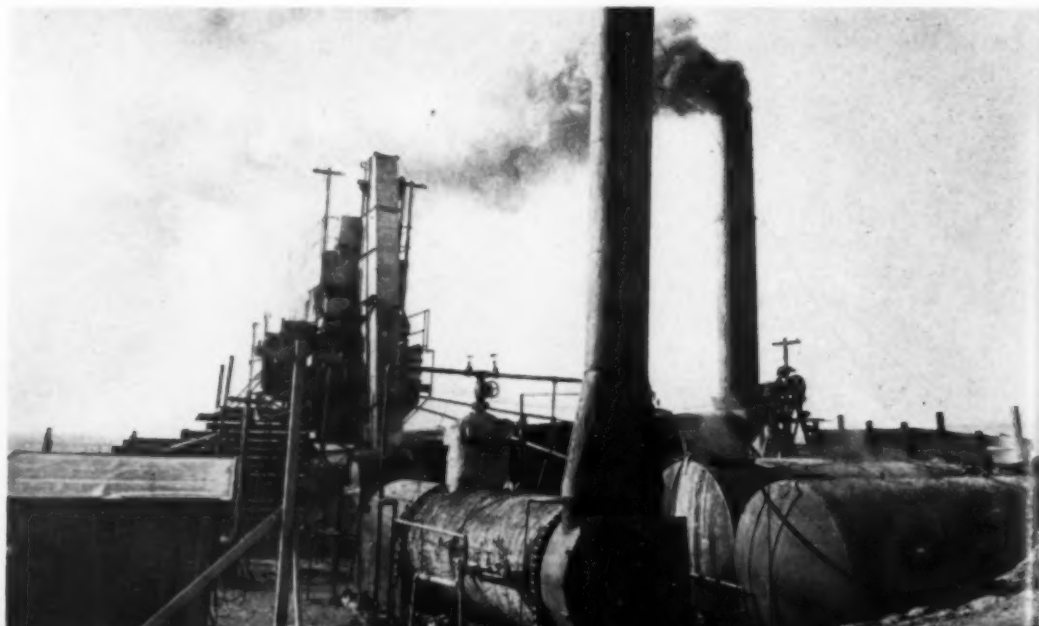
AGGREGATES ARE STOCKPILED, as bulldozer moves materials to dragline which feeds batching plant.

Page 78

SACKED CEMENT (below), brought to job by diesel semi-trailer truck, supplements bulk cement shipped in by rail. Bulk cement storage bin is next to aggregate batching plant.



DOUBLE HOT MIX PLANT (below), with one unit on either side of gravel pile, mixes asphaltic surfacing for runways and taxiways.



dent; and Milo Brown, assistant project manager.

The two main runway extensions and taxiways were constructed by A. Teichert & Son, Inc., of Sacramento. This part of the project was completed in 30 days at a cost of approximately \$1,250,000. The extensions, of 1,500 and 2,500 ft., were made of 3-in. asphaltic paving laid on a well-rolled earth base. Some 32,000 tons of hot plant-mix material was used. Equipment included 15 tractors, most of them equipped with bulldozers, 11 rollers, eight carryall scrapers, six power shovels, 70 trucks, including water wagons, two crushing plants and two mixing plants. Directing the work were A. A. Teichert, project manager; D. G. Hall, superintendent, and A. R. Kingwell, grading superintendent.

Building and Sewer Contractors

Stolte & Looz, of San Leandro, and MacDonald & Kahn, Inc., of San Francisco, were jointly responsible for construction of the 140 buildings and installation of sewerage facilities and other utilities. Cost was in excess of \$3,000,000. With the exception of the Imhoff tanks for the sewerage system, all buildings were of frame construction, including the 120-ft. long hangar of 160-ft. span on concrete foundations. At the end of the five-week period all priority buildings and approximately 50 percent of the non-priority construction had been completed. Supervisory personnel were George Looz, project manager; Chris Bustead, field superintendent; Eddy Nelson, assistant project manager; and Carl Daniels, yard superintendent.

J. E. Haddock, Ltd., of Pasadena, had the contract for construction of roads. The entire project was planned and supervised by the Sacramento office of the U.S. Engineer Department, with Colonel J. C. Hunter as district engineer; Henry M. Rich, head engineer; and J. E. Kitchen, area engineer on the project.

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LEGAL ADVENTURES

of TRACTOR CONN

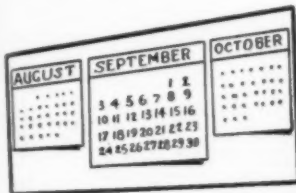


By LESLIE JOBB

No contractor ever tries to be his own dentist or his own shoemaker. It is even more dangerous for him to be his own lawyer. There are, however, some legal rules which every contractor should know, and these rules may be explained in plain English without resorting to the jargon of the law, unintelligible to most laymen.

This series of articles, dealing with the Legal Adventures of Tractor Conn, a typical contractor anywhere in the United States, explains some of these legal points in plain language for the contractor. Each one is based on an actual decision of an American Court.

The Case of the August-September-October Delivery



Tractor Conn had ordered cement and the order blank specified "delivery, August-September-October." Conn demanded no cement during August and the dealer tendered none, but in the month of September the dealer tendered part of the order, which Conn refused to accept.

"The order meant that part of the order was to be delivered in each month. When the first month went by without any delivery, that cancelled the contract," Conn contended.

"No, I could deliver all the cement any time, even during October, and still fulfill the contract," the dealer argued, and the New York courts, in *Bahnson & Co. vs Leaf*, reported in 197 New York Supplement, 160, ruled in his favor.

"It would be in harmony with the language used that it was intended to give the option to the seller to deliver the goods at any time during the three months mentioned," was the reasoning of the Court.

The Case of the Notary's Mistake

A dilatory debtor gave Tractor Conn a note payable at a certain bank. John Doe endorsed it. The note was dishonored, protested, and the protesting Notary Public notified Doe.

"I, the said Notary Public, did duly present the said note at the office of the said John Doe, and demanded payment, which was refused," the notice of dishonor stated.

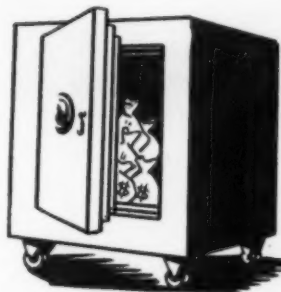


"The note should have been presented at the bank where it was payable, the notice of dishonor is insufficient, and I'm released as endorser," Doe might have said—but did not.

"I'll pay it, if the maker does not," is what Doe actually promised when Conn pressed for payment. When Conn sued on the note Doe set up the defense that he had not received a legal notice of dishonor.

"I admit that, but when the note was dishonored and you were notified, your promise to pay covers any defect in the notice," Tractor Conn retorted, and the Mississippi Supreme Court ruled in his favor in 111 Southern Reporter, 578, in *Brewer vs Automobile Co.*

The Case of the Escrow Deal



Tractor Conn had tried every trick in the bag to collect from a certain Roy Rigby, but without avail, and "pay or be sued" was his final threat.

"You'll get nothing if you sue," Rigby declared, "but I've just sold my business for \$36,000. The money's been paid to the local bank, the bank's agreed to hold it until the papers are signed, and then they're to pay it to my creditors, share and share alike."

"That's better than nothing," Conn agreed, found that the bank had applied \$35,800 of the money to notes which the bank held against Rigby, and had paid the balance of \$200 direct to him.

"You held the money in trust, and can't apply it to your own debt," Conn contended, and the United States Circuit Court in *Continental National Bank vs. Moore*, reported in 299 Federal Reporter, 270, ruled in his favor.

"The \$36,000 so held by the bank was not received in the ordinary course of business between the bank and the customer. It was the deposit of a third party and it was received in trust," was the reasoning of the Court.

The Case of the Disputed Shipment

The salesman had done his work well and left Tractor Conn's office with a \$1,000 order for building materials in his pocket. After not too many delays caused by priorities and what not, the order duly arrived at the station. On inspection Conn found that some of the order was good, some bad, and the rest indifferent. He refused to accept the goods ordered or any part of them.

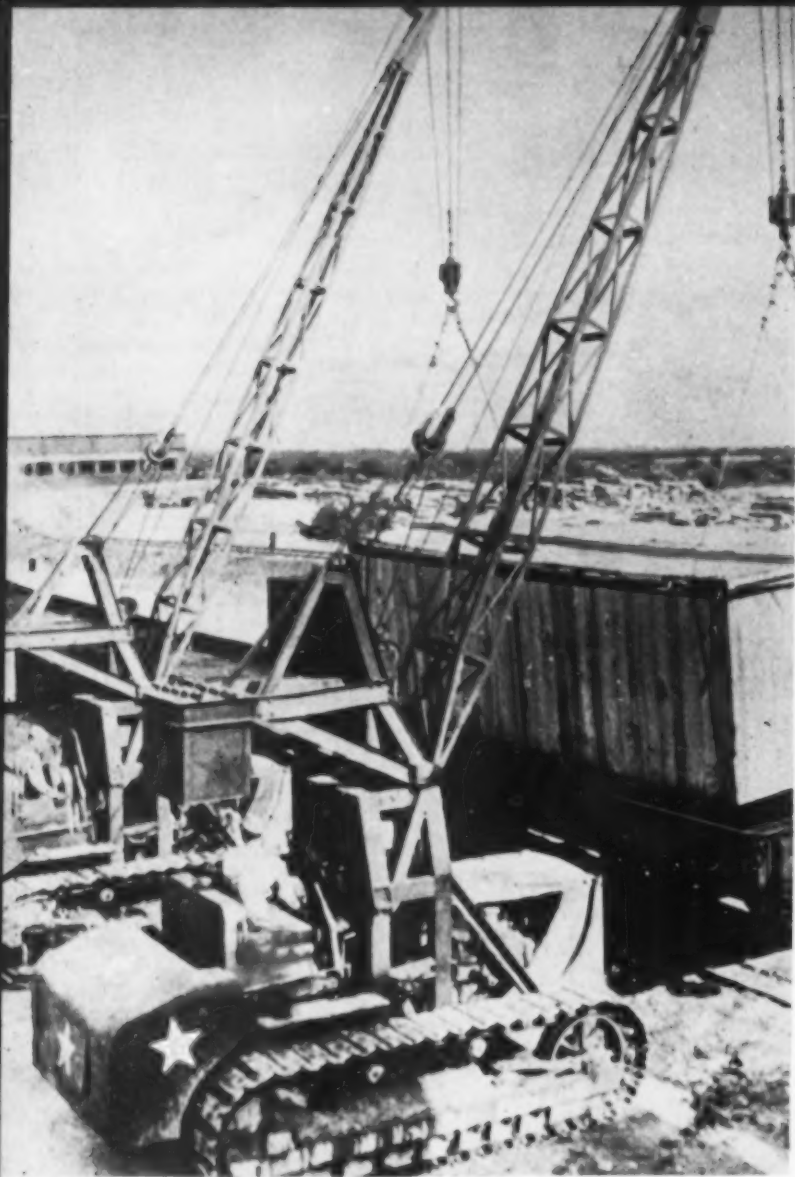
"We admit that some of the stuff was not up to par, but you can't cancel the whole contract. You're bound to accept the part that's all right and pay for it," the wholesaler contended.

"No, the tail goes with the hide—all or none," Conn declared. The law on this point is in his favor and the rule is that on an entire contract of sale the buyer may, within a reasonable time after learning the facts, reject the entire shipment, if part of it does not comply with the terms of the sale.

A leading case laying down this rule is *Fogg vs Rodgers*, a decision of the Kentucky Courts reported in 24 S.W. 248, and there are Minnesota, Nebraska, New York and Pennsylvania cases to the same effect.



**More Legal Adventures of
Tractor Conn Next Month**



TURNBUCKLE (below) for first of new Victory ships to be built at Richmond, Calif., yards of Henry J. Kaiser's Permanente Metals Corp. is installed to pull tank top down to insure snug fit against bottom shell. Workers are Shipwrights **JESSE WAR-RICK, JR.** (left) and **WILLIE POWELL**. Story on these new ships appears in "Construction Methods" for April.

Fare'n'Aft Photo

TWO TRACTOR CRANES lift crated 18,000-lb. half-track from railroad car in which it arrived at U. S. Army camp in England.

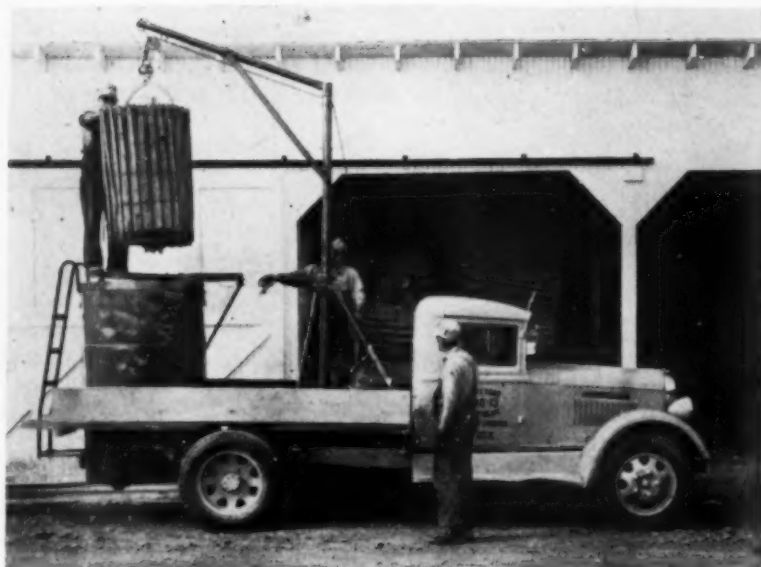
British Combine Photo

HOW

They Did It

CONSTRUCTION DETAILS

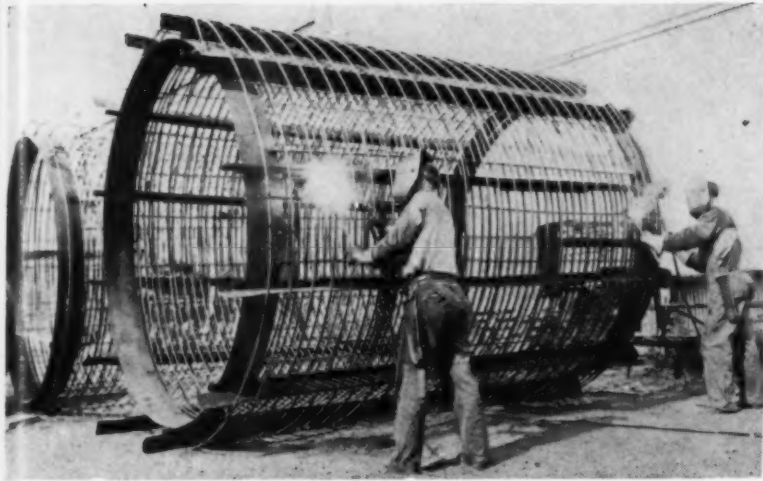
*For
Superintendents and Foremen*



FOR PAINTING SNOW FENCES, in form of wood slats wired together and placed along highways to arrest formation of deep drifts on traveled surface, West Virginia State Road Commission uses technique developed by Sylvester Mazella, equipment inspector, that saves hundreds of man-hours of labor. Rolled bundles of fencing (below) are raised by winch and crane on motor truck (above)

and dipped into gasoline drum containing mixture of paint and creosote preservative, as illustrated. Only two men are needed to handle this operation, which renovates one mile of fencing in 8 hr. as compared with the painting of only 100 ft. in same time by hand-brush method. Commission plans to treat its 129,000 lin. ft. of snow fence in this way, with resultant savings in time.





STEEL CAGES (above) for reinforcing 8 ft. 10-in.-dia. concrete pipe used in circulating water tunnels at Los Angeles Department of Water and Power steam plant are made by winding $\frac{5}{8}$ -in. plain reinforcing steel on mandrel and welding to horizontal spacers. Then rod ends are welded together to additional $\frac{1}{2}$ -in. spacers. In preparation for pouring concrete, cage is lowered over inside steel form, then outside steel form is lowered over cage (right).
Hobart Bros. Co. Photo



REMOVABLE SHEET STEEL HOUSING (left) incloses this Ingersoll-Rand air-cooled, gasoline-powered compressor, here shown in use by U. S. Army Engineers at work on airfield construction in North Africa. Unit is mounted as two-wheel rubber-tired trailer for quick transport to scene of action.
Army Signal Corps Photo



PLASTIC, COHESIVE CONCRETE made with air-entraining cement to increase scale resistance and durability is deposited on subgrade between steel forms for interchange connection of varying width on Detroit Industrial Expressway contract of Taylor Bros. Co., Inc., Birmingham, Mich., for Michigan State Highway Department (described in April "Construction Methods"). Outer line of false forms carries one end of Jaeger-Lakewood two-screed finisher and Flex-Plane joint machine. Jackson portable vibrating unit is employed to vibrate concrete along edges of pavement and adjacent to transverse expansion joints. To speed hardening of concrete on this ramp, 1 percent calcium chloride is added to concrete mix.



SOIL-CEMENT ROADWAY is graded and completed in one day by six-man crew using two small hand model Rototillers. Stones and trash are removed to side of roadway (above) while Rototillers pulverize ground. After hand grading with rakes and shovels, paper bags of cement, properly spotted, are broken open (right) and cement piles are evenly raked over entire area. Then Rototillers are used to mix cement thoroughly with soil and later used again to mix water with soil-cement mixture as area is sprinkled by hose. Full depth of mix before compaction is 8 in. Roadway is 200 ft. long and 17 ft. wide.





Get Wise TO THE IMPORTANCE

1. Power on *both* tracks at all times.
2. Move smoothly around curves.
3. Consume less power on turning.
4. Steer the same downhill as on the level.
5. Turn shorter with full loads.
6. Maneuver on side hill par slopes.
7. Stop and hold larger loads.
8. Handle off-center loads with trouble.
9. Operate with power always on.

ONLY CLETRAC *Tru-Traction* GIVES YOU THESE AN



GET THE FACTS FROM THIS BOOK

Ask for Bulletin No. 937 for complete details of Cletrac Tru-Traction and how it operates.



GASOLINE

CLETRAC *Tru-Traction*

CTO YOU OF CLETRAC *Tru-Traction*

Cletrac Tru-Traction—controlled differential steering—was designed and developed by Cletrac more than 25 years ago. It is an advantage exclusive with Cletrac tractors but has been employed by the armed forces in high-speed, track-laying military vehicles where its value has been proved on countless military operations in which other types of equipment would have lacked the necessary maneuverability or might stall and bog down. Isn't it sensible, then, to apply this same kind of power—Cletrac Tru-Traction—on your jobs?

THE CLEVELAND TRACTOR COMPANY • CLEVELAND, OHIO



ation **TRACTORS**

D I E S E L

Traffic Guide Lines

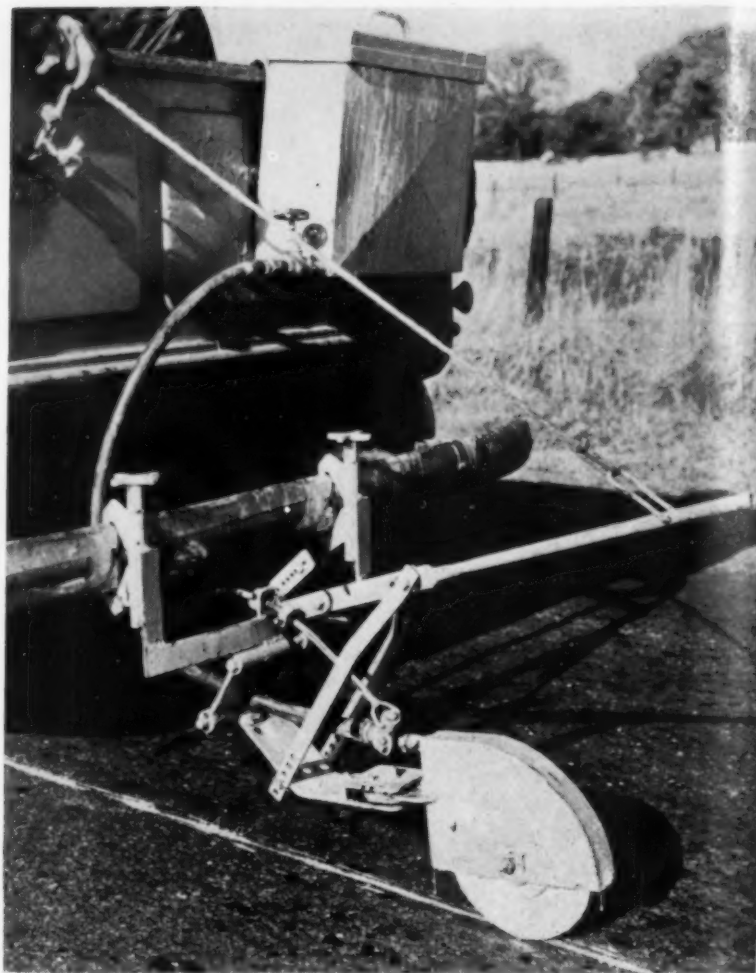
Spotted by New Device

Using Two-Man Crew



POINTER ASSEMBLY attached to front bumper of truck enables operator to follow straight line. Two pointers are mounted by adjustable clamps on bumper and tie rods, adjusted by turnbuckles, stiffen boom and allow for perfect alignment of pointers. Best results are obtained with driving speed of 10 to 12 mph.

WORKMAN RIDING (below) in truck controls paint valves and wheel lifting lever, which are attached to rear.



TRAILER WHEEL AND PAINT CONTAINER are attached to rear of truck. Paint drips on to wheel which runs along pavement to leave trail of white paint $\frac{1}{2}$ in. wide.

Photos, California Division of Highways

A NEW PAVEMENT MARKING WHEEL which will spot 50 mi. of highway a day, preparatory to traffic striping, has been developed by the California Division of Highways. Operated by a crew of only two men, it is the department's answer to a manpower shortage, coupled with rising costs and decreasing revenue. As described by Martin A. O'Brien, maintenance assistant, the device consists of two guide pointers rigidly mounted to the front bumper of a truck by adjustable clamps and a trailer wheel. The marking wheel is attached to the rear bumper and the paint container is secured to the tail gate. Paint drips down through a tube on to the wheel which runs along the pavement, leaving a $\frac{1}{2}$ -in. trail of white paint. Placing the wheel in the rear prevents the painted line from reflecting the slight movements of the truck's front wheels and eliminates the necessity of having a workman ride on the fender to regulate the flow of paint. Best results with this device are obtained by using a driving speed of 10 to 12 mph.

The clamps and wheel attachment are adjustable to fit any model truck or passenger car. In installing the device, it is first necessary to line up the truck and driver's eyes along a painted line. The two pointers then are placed and carefully adjusted to this line and the marking wheel is attached directly over the line's center. In using the wheel, white painted guide points 3 in. in dia. are placed at 100-ft. intervals.

When the regular traffic guide line is to be painted within one or two weeks, traffic lacquer can be thinned for the guide line, using one half paint and one half thinner. If the guide line must serve for long periods, a heavier application is made. A satisfactory marking line is obtained by using $\frac{1}{3}$ gal. of thinned lacquer per mile. Cold water paint is not suitable for use with this device, as it settles quickly and clogs up the valves and paint lines.



LONG REACH of boom and dipper stick enables 35-cu. yd. shovel to deposit load of coal overburden at distance of 240 ft.



HUGE DIPPER of 35-cu. yd. capacity serves with ample room as "garage" for Chevrolet truck.

Largest Shovel

STRIPS COAL OVERBURDEN WITH 35-CU. YD. DIPPER

THE WORLD'S LARGEST POWER SHOVEL went into action recently to do its share in alleviating the Nation's critical coal shortage. This huge coal stripper, with a capacity of 35 cu. yd. at every bite, is built by the Marion Steam Shovel Co., Marion, Ohio. It is owned by M. A. Hanna Co., St. Clairsville, Ohio, and is stripping overburden at the Hanna coal properties near Georgetown, Ohio. The

overburden here ranges from 25 to 75 ft. in depth.

Some idea of the size of the machine is gathered from the accompanying photos. Two dipperfuls fill a regulation railroad coal car to overflowing. One dipperful will fill a room 9 x 12 x 9 ft. One 35-cu. yd. dipperful is equal to 52½ tons of material. If the machine were placed in the

(Continued on page 128)

Present and Accounted For...A PAGE OF PERSONALITIES



NEW WASHINGTON REPRESENTATIVE of American Society of Civil Engineers is **E. LAWRENCE CHANDLER**. Since 1941 he had been associated with Charles T. Main, Inc., consulting engineer, Boston, Mass., for whom he spent the last two years as project manager in charge of construction of Wilmington, Del., shipyard and in engineering investigations in Latin America.



ASSIGNED TO NORTH ATLANTIC DIVISION, Corps of Engineers, as division engineer is **COLONEL ALBERT H. BURTON**, formerly on duty at Philadelphia as district engineer. Before going to Philadelphia, he was in the Office of Chief of Engineers at Washington, serving in River and Harbor Section and later with Construction Division. In his new post Col. Burton succeeds Brig. General B. C. Dunn.



NEW CONSTRUCTION MANAGER of Stone & Webster Engineering Corp. is **FRANK R. CREEDON**, former assistant director, Office of Rubber Director. Before taking charge of synthetic rubber plant construction program, he was for three years chief of Munitions Plant Section, Office of Chief of Engineers, U. S. Army. His present job is in connection with large government project now under way.



KEY MEN IN CONSTRUCTION of Dale Hollow Dam on Tennessee's Obey River are **O. M. STRANGE** (left), project engineer for Morrison-Knudsen Co., and his assistant engineer, **CECIL FELL**.



ASSOCIATED CONTRACTORS take stand alongside car driven by **C. H. BROWN**, assistant metropolitan engineer, Michigan State Highway Department, in charge of road construction on Detroit Industrial Expressway, described elsewhere in this issue. At right is **JOSEPH J. BAIRLEY**, superintendent, Bridgeport Core Sand Co., paving contractor, and at left is **LOUIS A. GARAVAGLIA**, of Louis Garavaglia & Son Co., co-contractor for grading and drainage structures on Bridgeport-Garavaglia Section.



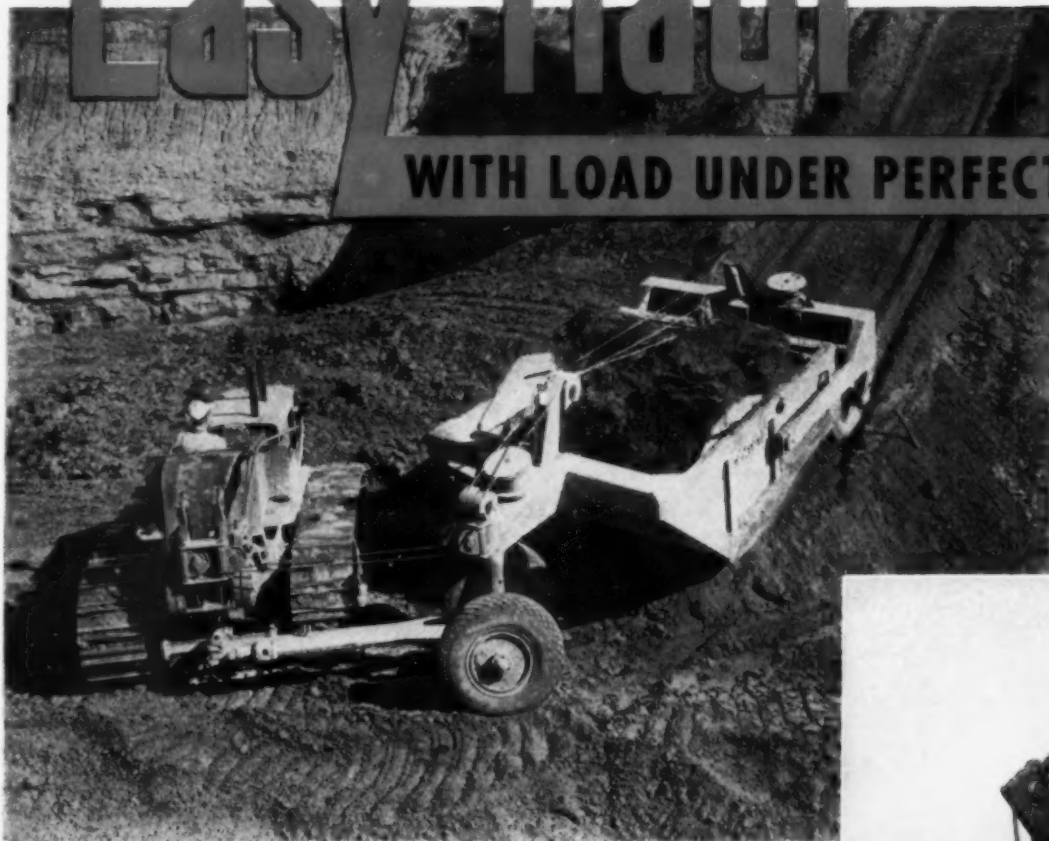
NEW DISTRICT ENGINEER for Army's New York Engineer District (right) is **LIEUT. COL. EDGAR W. GARBISCH**, succeeding Col. Albert B. Jones. He is in charge of military construction and supply programs in this area, as well as rivers and harbors and flood control work.

CONSTRUCTION PRIZE for best paper on construction subject published in "Civil Engineering" during 1943 has been awarded by American Society of Civil Engineers to **CARLTON B. JANSEN** (left), of Dravo Corp., Pittsburgh, Pa., for his article, "Submerged Shipways with Steel Sheeting Walls."



Easy Haul

WITH LOAD UNDER PERFECT CONTROL



*Bucyrus-Erie S-90 Scraper
equipped with Timken
Bearings in all wheels.*

Uphill, downhill, or on the level — scraping or carrying — Bucyrus-Erie S-90 Scrapers take all loads lightly because they take them on Timken Tapered Roller Bearings with which all the wheels are equipped. This also means smoother operation; greater endurance; lower maintenance.

Control of the load during loading and dumping likewise is rendered easier and more positive through the application of Timken Bearings (6) in the Bucyrus-Erie P-24 Control Unit installed at the rear of the tractor.

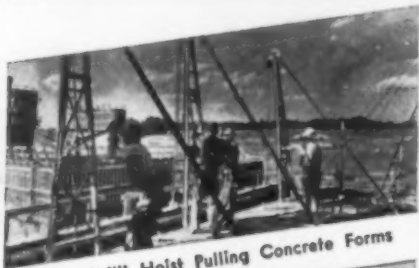
Whether you are a manufacturer or user of construction equipment it will pay you to make sure you have Timken Bearings at every suitable position. The Timken Roller Bearing Company, Canton 6, Ohio.



*Bucyrus-Erie P-24 Power Control Unit
equipped with 6 Timken Bearings.*



COFFING HOISTS



"Safety-Pull" Hoist Pulling Concrete Forms



"Quik-Lift" Electric Hoist Speedily Moving Pipe



Model "YC" Spur Geared Hoist Moving Large Truck Motor

Write Today for Catalog DG 6

**FOR SPEED
SAFETY
ECONOMY
DURABILITY**

IN PRACTICALLY ALL LINES OF
INDUSTRY COFFING HOISTS
ARE PLAYING A PROMINENT
PART IN SPEEDING UP

CONSTRUCTION

PRODUCTION

MAINTENANCE

COFFING HOIST COMPANY

Danville, Illinois, U. S. A.

CONSTRUCTION EQUIPMENT NEWS

MAY, 1944 REVIEW of Construction Machinery and Materials

SOIL STABILIZER called Stabinol, a dry powder resin compound, waterproofs soils and preserves bearing capacity of earth roads, runways, parking areas, playgrounds and pavement bases compacted at, or near, optimum moisture content. Mixed dry in proportion of 1 to 2 percent by means of usual road-building agricultural equipment into soils containing natural binder, resin powder is effective in making mixture water-repellent, even for soils having high silt or clay content. Mixing is ordinarily accomplished most readily with soil at about 85 percent of optimum moisture; small quantity of additional water then can be worked in for compaction at optimum. Once mixed, soil is unaffected by water and can be manipulated or stockpiled without damage or delay by wet weather. Soil roads treated with resin compounds five years ago are in good condition after carrying traffic throughout that time in all kinds of weather. Low cost of powdered resin compound makes its use practical even for soil stabilization jobs which must be built with



AFTER 22 MIN. PARTIAL SUBMERGENCE in water, compacted cores of natural soil (left) and same soil mixed dry with Stabinol resin powder (right) reveal comparative bearing capacities when weights are placed on them.

limited funds. Not recommended for granular soils lacking natural binder, because resin compound is primarily a waterproofing preservative which provides no added binding property in soil mixture.—Hercules Powder Co., Wilmington, Del.

AIRBORNE CARRYING SCRAPER, weighing approximately 6,339 lb. and known as Model D Tournapull, was designed to meet demand of Armed Forces for a unit of this type small enough to be



stowed in a transport plane, and also for use in civilian construction. Consists of power unit, dozer and 2.3-yd. carryall scraper and travels at speeds up to 16.1 mph. One-man operated and self-loading on most jobs with pusher block provided for boosting in tough unbroken materials. Unit hauls and spreads its own load—no auxiliary loading, hauling or spreading tools required. Scraper may be disconnected and price mover converted for hauling and lifting. As a hauling unit, Model D with flatbed Tournatruck handles 8,000-lb. load. Bed is low for easy loading and unloading. When used for crane work unit has lifting capacity of 4,000 to 10,000 lb., depending on crane model. May also be equipped with 6-ft. 8-in. Tiltadozer, husky Rooter tooth and other appliances. Civilian uses specified: building and paving, municipal, township and county governments, forest services, airports, highway departments, open pit operators, railroad superintendents. Maneuverability and low cost, according to its manufacturers, make unit an ideal tool for earthmoving and as a maintenance and utility unit on estates, parks, golf courses, cemeteries and realty subdivisions.—R. G. LeTourneau, Inc., Peoria, Ill.

★ ★ ★

SMALL DIAMETER BUILDING WIRE for use in wet locations has special thermo-plastic insulation with low moisture absorption properties, and, in addition, it is said to be superaging, high in dielectric strength and resistant to oils, acids and alkalis. It is flame resistant and will not support combustion. Its temperature rating is 50 deg. C. Self-protecting and requires no braid. Finish is hard, smooth and glossy, striped for grade identification. Dirt and foreign matter will not readily adhere to its surface. Small diameter of wire saves space, permitting more conductors to be used in one conduit or duct, or allowing smaller conduits or ducts to be used.—General Electric Co., 570 Lexington Ave., New York, N. Y.

★ ★ ★

ADAMS MOTOR GRADERS

"Bear Down"
IN TOUGH CUTTING



One of a series of ads on Adams motor grader features

****THE** blade and scarifier are the "business ends" of any motor grader. Not only do they need the backing of power and traction but of sufficient weight over them to work to the fullest advantage . . . Adams balanced weight distribution puts enough weight on the rear wheels to utilize the engine's power plus sufficient weight or pressure on the blade and scarifier to hold them to smooth, steady cuts. This is important, particularly in holding scarifier cuts to desired depth and in building subgrades in hard material as shown above. Lack of sufficient weight or

pressure causes a machine to ride over hard or tough spots thereby causing lack of uniformity in cutting.

Balanced weight distribution is but one of many operating advantages you will like in Adams motor graders when again you are privileged to buy new machines. In the meantime, use the services of your local Adams dealer to keep your present equipment in working order.



J. D. ADAMS COMPANY • INDIANAPOLIS, IND.

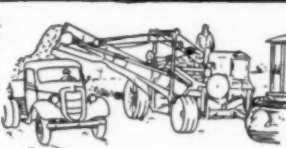
Granted a second Army-Navy Production Award for continued proficiency in the production of grading machinery for our armed forces



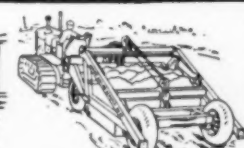
MOTOR GRADERS



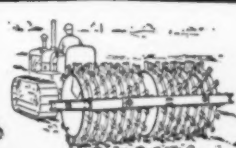
PULL-TYPE GRADERS



ELEVATING GRADERS



HAULING SCRAPERS

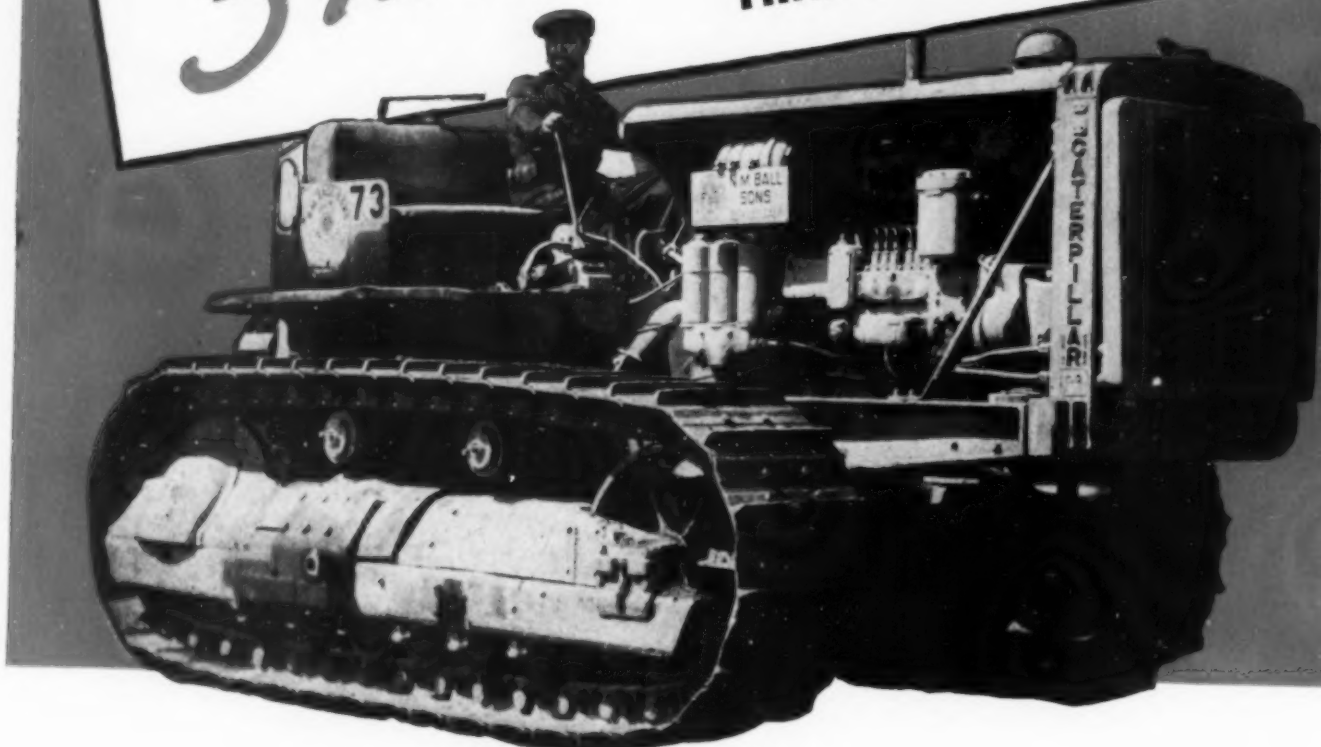


TAMPING ROLLERS

ADAMS

★ ROAD-BUILDING AND ★
EARTH-MOVING EQUIPMENT

IN THIS D-8... **VELVETOUCH** FACINGS WEAR
3 Times Longer
 THAN ALL OTHERS USED



Actual performance records kept by N. M. Ball & Sons, General Contractors of Berkeley, Calif., prove that Velvetouch wears, on an average, three times longer than any other type friction material they have used.

As a result, they have installed Velvetouch Bimetallic linings and facings on 90% of their earth-moving equipment, consisting of D-8 Caterpillar Tractors, Road Graders, Rollers, Le Tourneau Power Units, etc.

Mr. W. D. Sorenson, Sup't., Tractor Equipment, writes: "Velvetouch is all you claim it to be. We have tested it in our severest operations, and it has proven the best

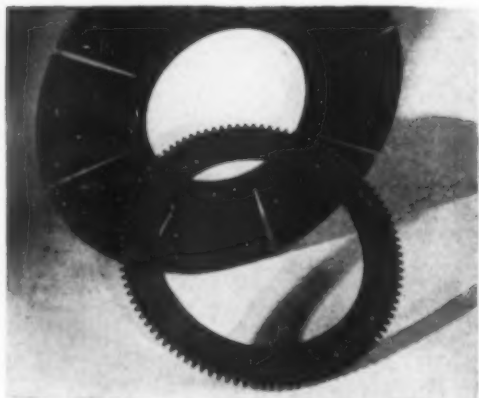
material we have ever used... cuts lay-up time and replacement costs to a minimum."

VELVETOUCH IS ALL METAL... made entirely from compressed powdered metals, welded to solid steel backing plates. Because it is all metal, Velvetouch wears longer... requires less adjustment... is little affected by oil or water.

For complete details write to:

THE S. K. WELLMAN CO.

1374 EAST 51st ST. • CLEVELAND 3, OHIO



FOR BRAKE AND CLUTCH

USE

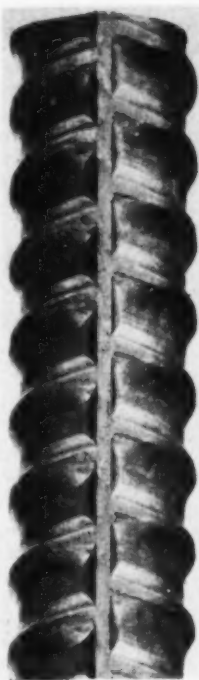
Velvetouch

BIMETALLIC FRICTION MATERIAL—TRADE MARK REGISTERED

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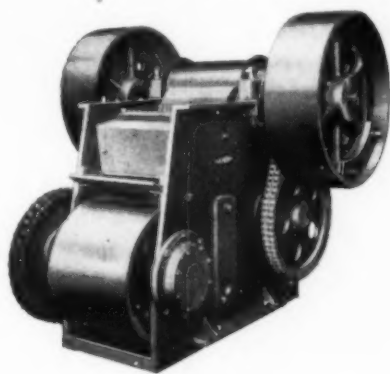
AROMA
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CONCRETE REINFORCING BAR. called Inland Hi-Bond, has been scientifically designed to give the greatest possible bonding value between concrete and steel. Increased effectiveness of reinforcing steel in concrete through greatly improved load transfer is brought about by use of reversed double helical ribs of proper height which extend between diametrically opposed longitudinal ribs. Helical ribs are spaced at close intervals and so dimensioned as to provide potential bearing and shearing areas, which in addition to having proper relationship to each other, are properly proportioned to the effective strength of the bar. — **Inland Steel Co., 38 S. Dearborn St., Chicago, Ill.**

★ ★ ★

DUAL-ACTION CRUSHER combines functions of jaw and roll crushers into one machine, resulting in a material saving in weight, space and horsepower. Instead of a jaw weighing approximately 5½ tons and a roll weighing about 6 tons, new combination crusher weighs 6 tons and occupies the same space as a large jaw crusher. It uses about one-half the horsepower consumed by the

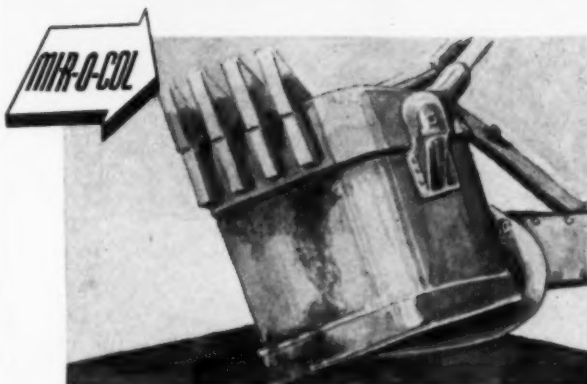


average jaw and roll. In actual use, the makers claim, it will out-produce any combination of jaw and roll of comparative size without plugging and without flats or slivers.—**Diamond Iron Works, Inc., 18th Ave. N. & 2nd St., Minneapolis, Minn.**

★ ★ ★

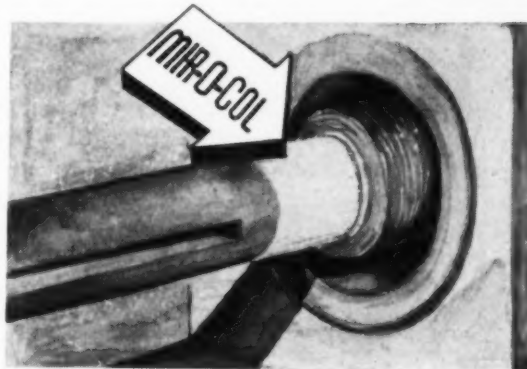
AROMATIC SOLVENT for metal washing machines is non-inflammable and non-combustible, has no low volatiles and forms sparkling clear solutions with water. Aqueous solutions are stated to be completely stable at elevated temperatures and have conclusively demonstrated their power to inhibit rusting of parts cleaned. Cost of alkyl aromatic solvent is said to be competitive in cost and is processed from non war-scarce chemicals.—**The Curran Corp., Dowling Bldg., Malden, Mass.**

KEEP YOUR EQUIPMENT OPERATING



Hard surfacing shovel teeth with Mir-O-Col will give up to 5 times the life's wear at top operating efficiency over unsurfaced teeth.

Grader blades should be hard faced with Mir-O-Col to give maximum resistance to the extreme conditions of wear from abrasion and impact to which they are subjected.



At the left is illustrated the packing gland surface of a concrete mixer shaft hard surfaced with Mir-O-Col for longer life's wear.

Send for your free copy of the "Welder's Guide to Successful Hard Surfacing Technique."

Inquiries invited from interested distributor organizations. Attractive territories available.

Keep operating speeds up, maintenance costs and expensive service interruptions down by hard surfacing with Mir-O-Col those equipment parts that must withstand extreme conditions of wear and abrasion.

MIR-O-COL ALLOY CO.

HARD SURFACING RODS
FERRO-ALLOY CASTINGS

"There's Nothing Accidental About Quality"

2416 EAST 53rd STREET
LOS ANGELES 11, CALIF.



**BUILT FOR
SPEED
ON HEAVY
CONSTRUCTION**



• Cutting big forms for concrete makes duplicate sawing by SPEEDMATIC the efficient method. Available sizes 7½", 8", 10½" and 12" blades.

Speedmatic
PORTABLE
ELECTRIC
HANDSAW

Construction jobs planned so that a portable saw is kept constantly at work have served to show the superiority of SPEEDMATIC — the saw specifically designed to do hour-after-hour sawing of heavy pieces — with less fatigue to the operator, and cleaner, better work. SPEEDMATIC'S efficient helical gear delivers 11% more power to the blade. The blade enters the cut at 7,000 revolutions per minute — all the power you'll ever need for fast, effortless cutting — no twisting or stalling.

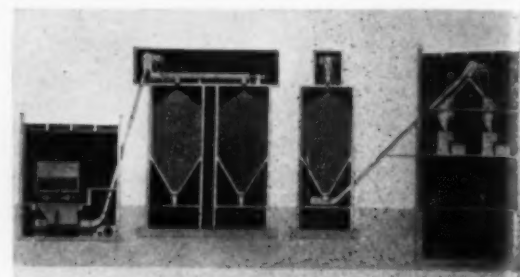
Only SPEEDMATIC has the extra wide base that sets the saw securely and safely, even when tilted at a 45° angle. Perfect balance allows one-hand operation in any position. Sturdy, compact housing assures long life.

Why be content with anything else when this top-quality saw will prove cheapest in the long run? See your Porter-Cable dealer (his name is in the classified 'phone book) or write us for further details.

**PORTER-CABLE MACHINE
COMPANY**

1920-5 N. Salina St., SYRACUSE 8, N. Y.

CONVEYOR-ELEVATOR SYSTEM, known as Rex Uni-Flo, provides a new method for mass handling of free-flowing bulk materials. Unit is of continuous stream type and is composed of a chain-belt-equipped, closely-spaced scraper-carrier flight, which operates in an inclosed casing. With the entire cross-section of the casing and all the space between the flights solidly filled with the material



being handled, a continuous flow results. Features: (1) Positive discharge mechanism definitely removes all material in conveyor system at point of discharge; (2) self-feeding—no auxiliary feeding devices are required; (3) self-cleaning—minimum of churning and degradation of materials either while in operation or after feeding has stopped. Operates at relatively slow speeds which means longer life and freedom from maintenance worries. Flexible in application with wide choice of basic units and few limitations as to layout. Conveys material horizontally, vertically or at any angle. Offers direct line of transportation by shortest possible route to conserve valuable productive space. Because it is essentially a closed-circuit method of handling, it is clean and dust-free.—Chain Belt Co., Milwaukee, Wis.



**When There's No Time for Breakdowns
It's Time to Get a Gorman-Rupp Pump**

Today, when time is the essence, you need a Gorman-Rupp Self-Priming Centrifugal Pump more than ever. There is not a quitter among them. The water passage has the same area as the suction hose. Muck, gravel, cinders — you simply can't clog them because solids cannot accumulate. There is no recirculation orifice to clog — no shut-off valve to jam — no hand priming regulator. There isn't a self-priming centrifugal pump made that will outwork a Gorman-Rupp in gallonage or continuous hours. Gas engine or electric motor driven. Capacities up to 125,000 GPH. There is a type and style to fit your every requirement. Stock for immediate delivery in 100 principal cities.

THE GORMAN-RUPP COMPANY, MANSFIELD, OHIO

GORMAN-RUPP
Self-Priming Centrifugal Pumps



The truck with the pigeon toes

A typical example of B. F. Goodrich development in rubber

FOR years many truck tires have worn out long before their time.

Take the case of the "pigeon-toed" truck. Most front wheels should toe-in slightly when the truck is standing still so that they will be parallel when running. If they toe-in too much, excessive tire wear results. A wheel that is only one-half inch out of alignment is dragged 87 feet every mile it rolls. Excessive wear results.


Truck owners have done their best to watch these seeming details which may shorten tire life. But still too many tires wore out before their time.

Then B. F. Goodrich drew on the

experience of many years in handling completely the tire maintenance of large bus fleets. They established the B. F. Goodrich Tire Conservation Service for fleet operators. Under this plan factory-trained tire men take over the complete supervision of tire maintenance. These men know how to spot the pigeon-toed trucks such as that shown in the picture. They know what to look for, how to stop tire troubles before they start.

Today hundreds of fleets, including many of the country's largest, use this conservation plan. Savings of rubber, mileage, and money have been huge. Typical of the comments of operators

are "We believe we will show a 25% saving" . . . "This service saves far more than it costs" . . . "The number of failures has been reduced 60%."

Only a few trained men are available to take over a limited number of additional fleets in certain areas. If you would like to know how this unusual tire conservation plan can increase your truck fleet tire mileage write the Tire Conservation Dept., The B. F. Goodrich Co., Akron, Ohio. For good truck tires see the local B. F. Goodrich dealer or Silvertown store. 

**B. F. Goodrich
Truck & Bus Tires**



TAPE THE FINGERS OF A *pianist*



LAY-SET-*Preformed* IS RELIEVED

Of course, this analogy is far-fetched, but it is still true that the wires and strands of non-preformed wire rope are virtually locked in position—under constant stress—uncomfortable—cranky. Being so, non-preformed cannot work so well, nor long, as Hazard LAY-SET, which is preformed at the mill and entirely relieved of internal torsional stresses and strains. LAY-SET Pre-formed wire rope gives you greater dollar value, requires no seizing when cut; it resists kinking and whipping; it is easier to splice and safer to handle. And, invariably, it wears longer.

Ever since Pearl Harbor, and even before, Hazard LAY-SET Preformed has been saving time and money for the Government, the Armed Forces, and the taxpayer.

Specify Hazard LAY-SET Preformed for all its built-in advantages.

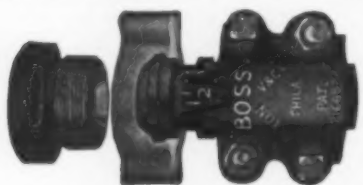
HAZARD WIRE ROPE DIVISION • Wilkes-Barre, Pa., Atlanta, Chicago, Denver,
Fort Worth, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco, Portland, Tacoma
AMERICAN CHAIN & CABLE COMPANY, INC. • BRIDGEPORT • CONNECTICUT



HAZARD LAY-SET *Preformed* WIRE ROPE

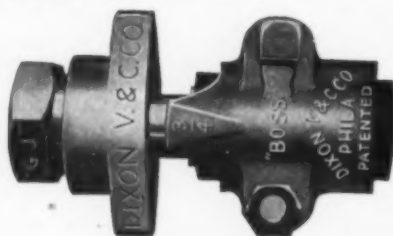
Names That Mean Longer, Better Service from Couplings and Clamps

"G J-BOSS" and "KING" are two trade names representing a group of class leaders in the DIXON line of couplings, clamps, menders, nipples and other industrial hose fittings. Their reliable quality and economical performance are well known to construction, mining and roadbuilding men . . . buyers and users who have learned that "if it's a DIXON product, it's dependable."



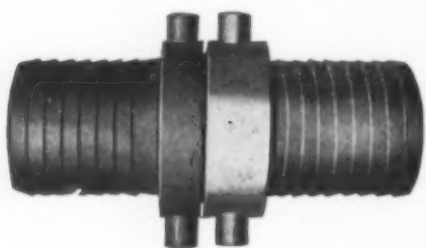
"G J-BOSS"
GROUND JOINT
FEMALE HOSE COUPLING
STYLE X-34

For high and low pressure steam, air and liquid hose. Ground Joint construction provides permanently leakproof, soft-to-hard metal seal when wing nut is tightened. "BOSS" Offset Interlocking Clamp anchors coupling to hose with a powerful, full-circumference grip, without pinching. Corrugated stem assures added holding strength. Made in sizes 1/2" to 4", inclusive, and furnished with male or female spuds.



"G J-BOSS"
GROUND JOINT
AIR HAMMER COUPLINGS

Strong, washerless, leakproof. Ground joint construction insures a permanently tight, soft-to-hard metal seal between stem and spud. "BOSS" Interlocking Clamp anchors coupling to hose with a powerful, full-circumference grip. No washers to replace . . . no danger of blow-offs. Compact Type, Style XLB-61, 1/2" and 3/4". Heavy Type, Style XHB-72, 3/4" and 1".



"KING"
MALLEABLE IRON
SHANK COUPLINGS

Strong, carefully made couplings for suction and water hose. Uniform in quality, threading and dimensions. Shanks have deep, clean corrugations. Pin lug swivel nuts are well recessed to hold washer when hose is disconnected. Heavy Pattern (Illustrated) has shanks long enough for two clamps, and pin lugs on both male and female ends. Sizes, 3" to 8", inclusive. Regular Pattern has pin lugs on female only, and shanks designed for one clamp. Sizes 1 1/2" to 3", inclusive.

Carried in Stock by Manufacturers and Jobbers of Mechanical Rubber Goods.



"KING"
SINGLE AND DOUBLE BOLT
HOSE CLAMPS

The strongest clamps of their kind, and easiest to attach. Bolt lugs are heavily reinforced. Tongue, and ears for vise jaws, are full width of clamp. Perfect conformance to hose circumference, with broad bearing surface, insures equally distributed compression when clamp is tightened, without cutting into hose cover. Double Bolt style has quadruple take-up, providing exceptional gripping power. Sizes: Single Bolt, for hose 7/8" to 5 1/4" O.D., Double Bolt, for hose 3 1/2" to 17 1/4" O.D.

RUBBER GASKETS, known as "Rolagrip" and "Gruvagrip" and produced in thirty sizes, are enabling American soldiers in the Solomons, the Aleutians and in Africa to provide immediate supplies of fuel and water for the fighting front and for isolated landing fields. Each gasket links



together two sections of pipe held in place by a metal housing which fits over the gasket. These gaskets permit portable water and fuel lines to follow contour of land without loss from seepage of badly needed supplies. Small group of soldiers can lay many miles of these portable fuel and water lines in a few hours, as only 5 min. is required for coupling two pieces of pipe with one of these gaskets. Lines may also be quickly disassembled and used somewhere else with the same rubber sealing rings between sections of pipe. Photo shows how Rolagrips are fitted to section of pipe.—Gustin-Bacon Co., Kansas City (7), Mo.

★ ★ ★

OIL AND GREASE ABSORBENT, known as Speedi-Dri, although primarily intended for use on slippery floors, is proving to be a handy agent in other cleaning operations, such as reclaiming of oil-soaked belting, ropes, shoes, clothing; coating of floors in paint-spray departments; removal of



oil from tools in the heat-treating process; tumbling of processed parts, and removing oil film from metals that are to be painted. Speedi-Dri is also proving of value in deodorizing plants and in increasing light reflection. Because of its fire-retardant qualities, it is being widely used to replace sand in fire buckets.—Refiners Lubricating Co., 601 W. 26th St., New York City, and Waverly Petroleum Products, Drexel Bldg., Philadelphia, Pa.

DIXON

VALVE & COUPLING CO.

Main Office and Factory: **PHILADELPHIA, PA.**
BRANCHES: CHICAGO · BIRMINGHAM · LOS ANGELES · HOUSTON



Continuous operation, excessive wear, and today's replacement difficulties demand *better maintenance* of equipment.

A key to better maintenance is *better lubrication*.

Sinclair offers lubricants highly specialized for better lubrication of **CONSTRUCTION MACHINERY**.

Sinclair Pennsylvania and Opaline Motor Oils stand up under heavy duty service . . . have long-lasting film strength that holds down engine wear, lay-offs and replacements.

Opaline and Universal Gear Lubricants and Gear Oils maintain highly

efficient lubrication under severe punishment in transmissions, differentials and enclosed gears.

The Sinclair line includes oils and greases specially developed for track rollers, open gears, chain drives, cables and all types of bearings.

Where continuous loads and overloads threaten shorter life for moving parts, Sinclair lubricants make for *better maintenance*. Consult us about your lubrication problems.

(Write for "The Service Factor" — published periodically and devoted to the solution of lubricating problems.)

SINCLAIR LUBRICANTS-FUELS

FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE SINCLAIR REFINING COMPANY (INC.), 630 FIFTH AVENUE, NEW YORK 20, N. Y.

IT'S NOT SO EASY—

BUT EVEN IN THE DESERT, WITH THE HELP OF
HERCULES CARGO BODIES, THE ARMY
REPAIRS ITS EQUIPMENT



HOW MUCH EASIER IT IS FOR YOU TO KEEP YOUR EQUIPMENT IN REPAIR!

Don't neglect your Hercules Hydraulic Hoists and Bodies, or your Hercules Split-Shaft Power Take-offs. Quick service on repairs is always available through the nearest Hercules Distributor.

HERCULES STEEL PRODUCTS CO.
GALION, OHIO

*It's got something
on the
ball!*

27 sizes with 4-hole head, 15,
sizes with ratchet head. 8 3/4"
to 29 3/4" high, 2 to 19 1/2"
lift, 5 to 30-tons capacity.



Self-leveling, drop forged cap "floats" on large chrome-molybdenum steel ball, reducing friction 88%. Safety peephole in unbreakable malleable iron base prevents over-extension of screw. Not just a screw jack—it's a Simplex Jack.

Templeton, Kenly & Company, Chicago

Better, Safer Jacks Since 1899

Simplex
LEVER - SCREW - HYDRAULIC
Jacks

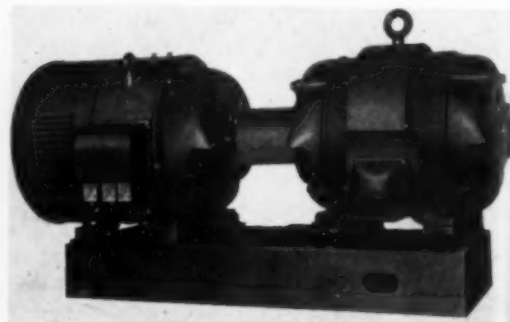
**WATERPROOFING OF EXTERIOR MASONRY SUR-
FACES** of concrete, brick or stucco is made possible
by the application of Waterfoil, a cement paint
made of irreversible inorganic gels, which reacts
chemically with the lime hydrate of masonry to
form a fine, hard heavy coating, impeding the pene-



tration of water. Applied by a stiff brush and in-
volving the use of no primer, the product seals
hairline cracks, but allows the masonry to
"breathe" through microscopic pores while inhibit-
ing the rusting of steel mesh or reinforcing bars.
Waterfoil is offered as a means of building main-
tenance, designed both to waterproof and to re-
store the appearance of exterior masonry surfaces.
The accompanying photographs show the "before"
and "after" appearance of an industrial building
water-proofed by the method above described.—
**A. C. Horn Co., 43-36 Tenth St., Long Island City,
New York.**

★ ★ ★

AC-DC MOTOR GENERATOR SET designed to sup-
ply power for from 15 to 30 men welding at same
time, is powered by 160-hp. 440-v., 60-cycle, 3-
phase, 1,160 rpm., 1-hr. 50-deg.C. temperature rise,



squirrel cage induction motor of drip-proof con-
struction. This motor drives a 70-v. 1,500 amp., flat
compounded, dc. generator, rated 1-hr. 50-deg.
temperature rise. These machines may be oper-
ated in parallel when large quantities of power
are required.—**Century Electric Co., St. Louis 3, Mo.**

around and around . . .



Allis-Chalmers
photo

This test track for 18-ton military tractors is paved with durable, shock-absorbing Texaco Sheet Asphalt.

. . . go these **18-TON TRACTORS**
on a Texaco-paved test track

Here's a rugged test for a pavement.

From Allis-Chalmers assembly lines, a steady stream of powerful 18-ton military tractors go through their paces on this Texaco Asphalt test track near Springfield, Ill.

To withstand this exceptionally hard service, a two-course Texaco Sheet As-

phalt pavement was constructed, each course 1½ inches thick. Supporting the resilient, wear-resisting Texaco pavement is a 12-inch waterbound macadam base.

Wherever heavy traffic must be served, construct Texaco Sheet Asphalt. Texaco Engineers, who are Asphalt specialists, are at your service.



THE TEXAS COMPANY, Asphalt Sales Dept., 135 E. 42nd St., New York City
Philadelphia Richmond Boston Chicago Jacksonville Houston

TEXACO ASPHALT



As Amazing as Aladdin's Lamp

In the Pacific Northwest, 650 suburban acres were transformed into the country's largest mass housing project, within the space of a few months. Motor trucks helped to transport the materials for 9,942 dwelling units housing around 40,000 members of war working families.

A Southwestern firm manufactures as many as 5,000 prefabricated houses in a month. Each day hundreds of these units, five to a motor truck, roll across the nation's highways to Army Camps and war housing areas.

At an Eastern Army Camp, miles from the nearest rail line, construction schedules called for the completion of 1,200 buildings for 20,000 men within 75 days. Every foot of lumber, every pound of nails, every piece of building material was brought in by motor truck.

Since war started, there have been scores of such housing construction miracles . . . miracles that would be worthy of even Aladdin's Magic Lamp. In every case, trucks made them possible!

INVEST IN VICTORY
BUY MORE WAR BONDS

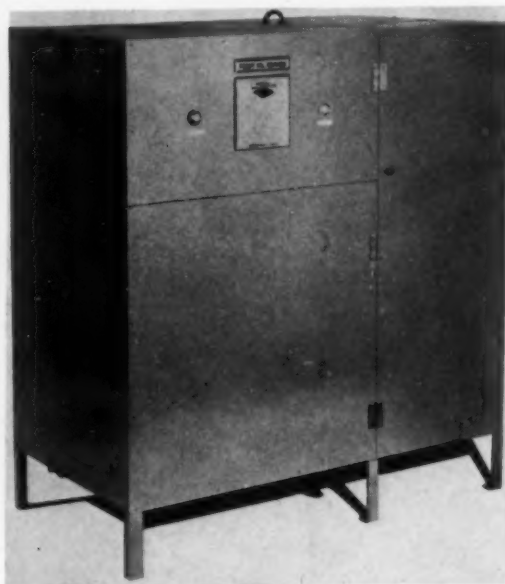


HIGHWAY TRANSPORT...
VITAL TO VICTORY AND THE AMERICAN WAY OF LIFE

GMC TRUCK & COACH DIVISION
General Motors Corporation

Home of GMC Trucks and GM Coaches . . .
Volume Producer of GMC Army Trucks and Amphibian "Ducks"

OIL RECLAIMER, designed to clean lubricating oil with continuous and automatic operation, is said to permit utilization of common refinery earths available on open market and to remove fuel dilution, acids, solid and colloidal carbon, dirt and similar



matter from oil. Also restores oil emulsified by water. When piston varnish and sludge deposits are present, manufacturer offers guarantee on removing them and preventing recurrence. Single machine may be installed to serve entire power plant, large or small. Ability to restore transformer oils to 30,000 v. dielectric strength also claimed for this machine.—Youngstown Miller Co., Sandusky, Ohio.



Light enough to handle . . . heavy enough to "take it". These HIGHLY PORTABLE CMC's have proven their durability and sturdiness on important jobs all over the world. They are "first choice" Mixers in peace or war. All standard sizes. Get information.

CONSTRUCTION MACHINERY CO.
Waterloo, Iowa

Mixers • Pumps • Hoists • Batching &
Placing Equipment • Saws • Carts • Barrows

G. I. finds a friend



G. I. (as the Yank soldier prefers to call himself) has to handle a lot of wire rope these days. On landing barges . . . on cranes, hoists, and power shovels . . . and especially on trucks and tanks, most of which carry an emergency winch cable as standard equipment. For such uses, Bethlehem has supplied millions of feet of wire rope—much of it in our top-quality Form-Set (preformed) construction.

When a truck is mired, or when there's a heavy hauling job to be done, the G. I. winch cable is a friend in need. And when it's supple, easy-handling Form-Set it's doubly a friend. That means a lot to G. I., who as likely as not was a traveling salesman or grocery clerk in civilian life, and had no experience in handling wire rope.

Because its strands and wires are preformed in their corkscrew shape, Form-Set is free from locked-up constructional tensions. It's easy to splice and spool, requires no seizing, and sprouts no spiny wire bristles to slash the hands of men who work with it. All of which explains why Government agencies have bought it in such vast quantities for military operations.

You get the utmost in service and long life from Form-Set when it's in the Purple Strand grade. Purple Strand wire rope is made of strong, tough Improved Plow Steel, the highest-quality steel that's used in wire-rope construction.

In Form-Set Purple Strand you get the ideal combination of preformed ease of handling with the unmatched strength and ruggedness of Improved Plow Steel. Plan to order it for your next wire rope job, or for replacements. But make your plans, please, as far in advance as possible, so that you will be sure to have Form-Set Purple Strand Wire Rope when you need it.

Form-Set
Purple Strand
Wire Rope





FASTER

VIBER

Concrete Vibrators

Get the Job
Done Ahead
of Schedule!

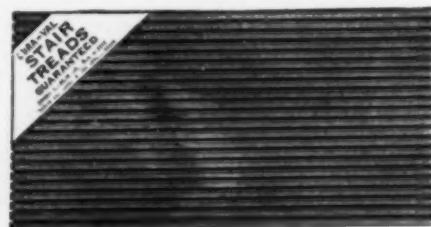
There's a leader in every field. For concrete vibrating, it's VIBER, pioneer producer of concrete compacting equipment. • RPM of latest Viber Vibrators is 9500 in concrete! Get acquainted with ALL the exclusive features of VIBER-ating equipment which safely speed up the job . . . field-proved ruggedness, handy portable size, 3 kinds of power, interchangeability of units. Follow along with the leader and keep "ahead of schedule"!

WRITE
for our latest
catalog describ-
ing all the new
Viber developments

**VIBER
COMPANY**

726 South Flower Street
BURBANK, CALIFORNIA

COMPOSITION STAIR TREADS, named Dura-Val and Dura-Val de Luxe, are made of asphalt and felt and are suitable for replacing treads of rubber. Waterproof, washable and guaranteed long wearing. Made with corrugated non-skid surface.



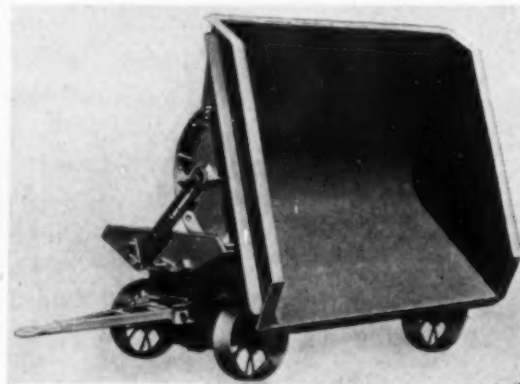
Available in both flat and nosing types, in black. Standard flat tread is 9x18 in. Nosing tread is made in two sizes, 9x18 and 9x24 in. Extra size treads furnished on order. Treads may be quickly, easily and permanently cemented to wood, metal, concrete and other materials with So-Lo's stair tread cement.—So-Lo Works, Inc., Loveland, Ohio.

★ ★ ★

CIRCULAR SLIDE RULE, especially adapted for carrying in a brief case, is made by an improved process of graduating black lines on white vinylite and is small in size, light in weight and accurate. Grease and waterproof and easily cleaned by washing. Tests of this device have shown, according to its makers, that its average accuracy in making rapid slide rule calculations is within 1/4 of 1 percent. May be dropped, trampled on or immersed without injury. Scales are on a disk 6 in. in dia. Length of multiplication, division scale 13.8 in. as against 10 in. of regular 10-in. slide rule. While familiarity with use of other slide rules is a decided advantage and directly applicable to the Monitor rule, experience is not necessary and its mastery may be easily attained by employing full and complete directions given in the manual which accompanies each rule.—Tavella Sales Co., 27 West Broadway, New York (7), N. Y.

★ ★ ★

HAND- OR TRACTOR-PULL TRAILER, available in two models, is a roll-over type unit balanced for speedy dumping, after which body rights itself and locks in normal position. Phil-Dump trailer, 1-cu. yd. capacity, is quickly coupled to any type



of factory tractor. Load is dumped by chain control without necessity of operator leaving seat. Hand-pull model, 3-cu. yd., is equipped with two fixed and one swivel roller bearing plastic wheels for floor protection.—Phillips Mine and Mill Supply Co., 2214 Jane St., Pittsburgh (3), Pa.



Construction Speeded with the New CLIPPER HOIST

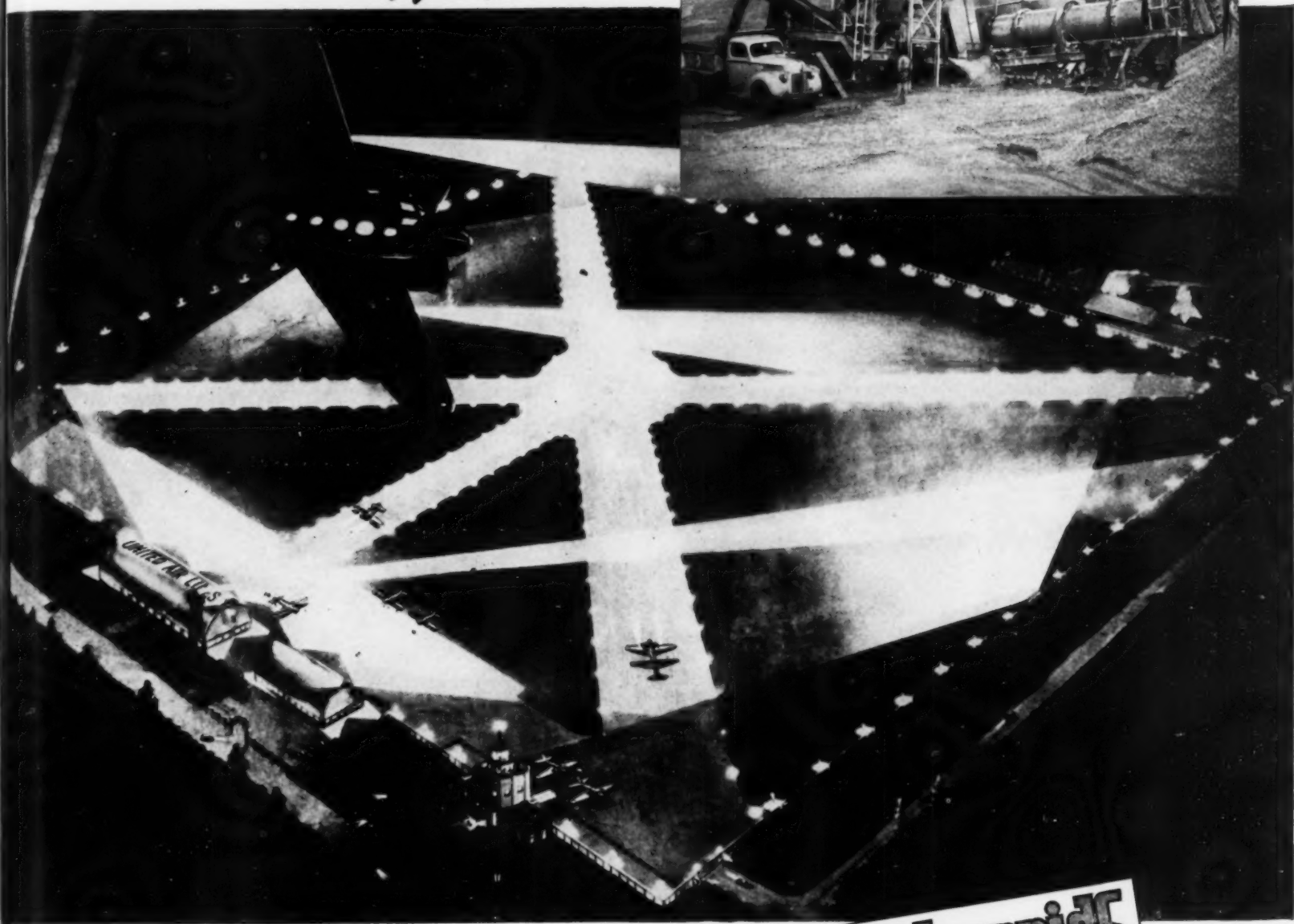
**FREE
TRIAL
on Your
JOB**

PORTABLE AND EASY TO OPERATE
You'll want the New Portable Clipper Hoist on your job . . . Quickly set up ready for use. The Clipper Hoist is operated by only one man!

FEATURES AUTOMATIC UNLOADING
FASTER . . . Brick, tile, concrete and flue lining can be hoisted to greater heights, without fatigue.
FLEXIBLE . . . Practical for every job.

THE CLIPPER MANUFACTURING COMPANY
4040 CHOUTEAU ST. LOUIS, MO.
District Offices and Warehouses: Philadelphia, Kansas City, Austin, Tex.

AMERICA IS
Built with Aggregate!



HIGHWAYS TO THE SKY!

To the global airlines, highways to the sky are runways that are safe, smooth, permanent, and have tremendous load-carrying capacity. The engineer and contractor see them as aggregate at so many cents per yard. And, that price has to be the lowest possible.

Refinements in crushing equipment are lowering production costs despite increasingly strict specifications. Such improvements are the result of American free enterprise which developed the line of Cedarapids plants.

When you have a contract to build tomorrow's HIGHWAYS TO THE SKY, use aggregates produced by Cedarapids crushing plants. All sizes and types available. You'll get better results and it will cost you less.

*Remember it's Iowa — headquarters
for Aggregate Producing Equipment!*

IOWA MANUFACTURING COMPANY
CEDAR RAPIDS, IOWA

Cedarapids

Photo by
Ewing Galloway

Built by
IOWA

THE IOWA LINE of Material Handling Equipment Includes

- ROCK AND GRAVEL CRUSHERS
- BELT CONVEYORS — STEEL BINS
- BUCKET ELEVATORS
- VIBRATOR AND REVOLVING
SCREENS
- STRAIGHT LINE ROCK AND
GRAVEL PLANTS
- FEEDERS — TRAPS
- PORTABLE POWER CONVEYORS
- PORTABLE STONE PLANTS
- PORTABLE GRAVEL PLANTS
- REDUCTION CRUSHERS
- BATCH TYPE ASPHALT PLANTS
- TRAVELING (ROAD MIX) PLANTS
- DRAG SCRAPER TANKS
- WASHING PLANTS
- TRACTOR-CRUSHER PLANTS
- STEEL TRUCKS AND TRAILERS
- KUBIT IMPACT BREAKERS

A Griffin Wellpoint Job

There's a story behind this picture!



Millions of Gallons a Day!

THE GRIFFIN WELLPOINT WAY

Four GRIFFIN Model 108, 10", 2500 G.P.M., Wellpoint Pumps, each discharged through 50' of 8" pipe, into the ditch in the above picture. The predrained cut *BEHIND* the spoil-bank is 15' *BELOW* water level in the ditch—but not one drop could filter back through the Wellpoint System which was protecting the dry working area.

For Sale and for Rent

MID-WEST

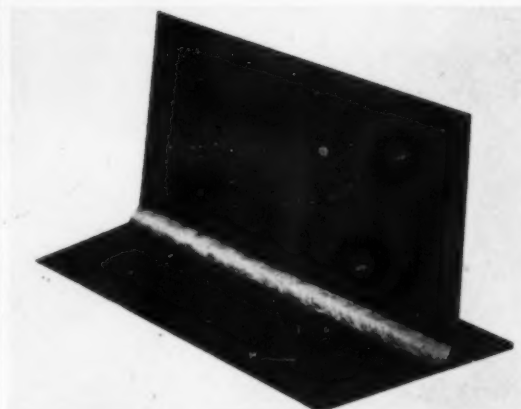
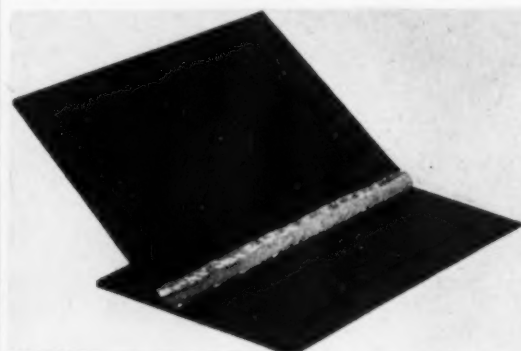
GRIFFIN EQUIPMENT CO., INC.
548 Indiana Street • Hammond 1662
HAMMOND, INDIANA

SOUTH

GRIFFIN ENGINEERING CORP.
633 N. Myrtle Ave. • Jacksonville 5-4516
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MAIN OFFICE: 881 EAST 141st STREET, NEW YORK 54, N. Y.
GRIFFIN WELLPOINT CORPORATION

AC-DC ELECTRODE for welding steel in all position, known as "Fleetweld 37", was originally designed primarily for light-gage material, but extensive use has shown it to be a fast operating electrode under all conditions, according to its makers. Feature: no slag interference when welding vertical down, making it possible to achieve



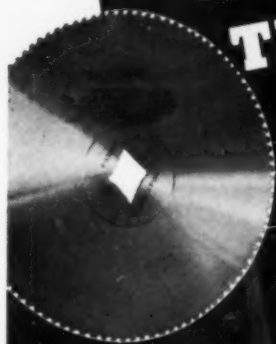
satisfactory results in this position in which greatest welding speeds on 8- to 16-gage steel are obtained. Ability to withstand higher currents, both ac and dc, makes possible higher welding speeds than normal. Easy handling characteristics in all positions make it especially useful for general purpose work. Since with proper currents, makers claim electrode will neither stick nor burn through, it is highly recommended for light-gage welding. Physical properties: Tensile strength, 70,000 to 80,000 psi.; yield strength, 60,000 to 68,000 psi.; ductility (EL. in 2 in.) 18 to 25 percent. Available in 1/8, 5/32, and 3/16 in. sizes, in 14-in. lengths and packed in 50-lb. standard containers.—The Lincoln Electric Co., Cleveland, Ohio.

★ ★ ★



TRUCK TIRE, called Speedliner Silvertown and available in size 7.50x20, eight ply, or larger, runs cooler than ever before, according to its makers, because of reduced tread thickness at shoulders and addition of new ventilating grooves in shoulder blocks, thereby assuring longer tire life and greater possibility of recapping. Sidewall has been thickened at base of grooves between the shoulder blocks, and ornamental rib is of shallower construction providing better distribution of stresses and reducing danger of sidewall cracking.—The B. F. Goodrich Co., Akron, Ohio.

Did you know
THAT YOUR
SKILSAW
CAN DO
THESE JOBS,
TOO?



CUT METAL



- With a Friction Blade, SKILSAW cuts fast through flat or corrugated metal, through stainless steel, brass, lead and iron.
- Grooves up to $\frac{3}{8}$ in. in width are easy to make when you use a Grooving Blade instead of the regular blade.

GROOVE LUMBER



CUT CONCRETE



- With an Abrasive Disc... SKILSAW is ready for fast sizing of concrete, such as "Celocrete" blocks, or slate, tile or limestone.
- With Abrasive Discs, SKILSAW also quickly cuts asbestos cement sheets for walls and sidings.



CUT ASBESTOS CEMENT SHEETS

• It's no news that your SKILSAW is the finest labor-saving tool you can own for all the ordinary construction cuts in lumber.

But do you realize that there's lots of other work that your SKILSAW can do? . . . and do it easier, better, faster! Grooving, for instance . . . cutting metal and concrete are other examples. And that's just the beginning of many different cutting jobs where SKILSAW can help you build *faster and more profitably!*

If you are not using your SKILSAW for ALL cuts in construction, you're not getting all the time and labor saving benefits SKILSAW can give you.

SKILSAW'S new catalog, free on request, will show you how to make a "4-in-1" tool out of your SKILSAW. Send for it today!



SKILSAW, INC.

5033-43 Elston Ave., Chicago 30, Ill.

Sales and Service Branches in All Principal Cities



A Complete ASPHALT PLANT

designed especially for handling repair work efficiently



FLUIDOMETER

Automatic Metering System—saves time, materials, insures accuracy and uniformity. For all types of plants.



This portable H & B patch plant was developed to meet a long felt need for an asphalt paving plant which could produce small quantities efficiently and economically. None of the features essential to proper production and control have been sacrificed, yet all are incorporated in one self-contained unit. Material to meet any hot or cold mix specification may be manufactured with this plant. Further information on this or other H & B portable and stationary asphalt plants will be sent on request.

HETHERINGTON & BERNER, INC.
INDIANAPOLIS 7, INDIANA

Hetherington & Berner

Dependable Parts Service Keep
"CLEVELANDS"
ON THE JOB

BREAKING production records for new machines to meet military demands is only part of the job.

Servicing hundreds of machines (some fifteen to twenty years old) is another tough, important job.

"CLEVELAND'S" recognition of this problem by maintaining superior parts service has won many spontaneous expressions of owner-approval.

"CLEVELAND" will maintain this vitally necessary quality service, and recommends that you as an owner do your part by paying regular attention to lubrication—keeping all bolts tight—using sharp rooters.

THE CLEVELAND TRENCHER COMPANY
20100 ST. CLAIR AVE "Pioneer of the Small Trencher" CLEVELAND 17, OHIO
"CLEVELANDS" Save More... Because they Do More

NEW TYPE TRACTOR CRANE, known as Drott Go-Devil, has positive hydraulic up and down power that enables the boom to handle loads weighing up to 2,000 lb., and large pneumatic tires coupled with oversize solid front tires which provide traction that permits outfit to carry loads quickly over soft ground and up steep inclines. Boom swings full 360 deg., has an extension of 90 in. and reaches to a height of 14 ft. 2 in. Turning radius, 10½ ft. and traveling speeds up to 7 mph. Loading space on platform, 20 sq. ft. Hoist worm and wheel lock arrangement is used instead of clutches and brakes for all lifting and swinging operations.



Pusher plates and drawbars at both ends of unit enable it to handle pushing and towing. Powered by 4-cylinder, 16-hp. gasoline engine. These unusual traction characteristics enable crane to work effectively indoors or outdoors and to handle most types of lifting, loading, transporting and unloading in shop or yard. Claimed to be ideal for loading and unloading box cars, gondolas, transport trucks and airplanes. May be turned under all conditions with loaded platform without effort on part of operator who has all controls within easy reach.—**Hi-Way Service Corp.**, 3841 W. Wisconsin Ave., Milwaukee, (8) Wis.

★ ★ ★

LIFT TRUCK, 2,000-lb. capacity, for use in crowded quarters, has pneumatic tires which are claimed to double operating speed and to permit faster starting and stopping and smoother travel over rough ground or floor obstructions such as cleats



and car tracks. Also provides better traction for going up ramps and starting and stopping on wet or greasy floors. Unit is a gasoline-powered fork type with a 25-hp. 4-cylinder, V-type motor equipped with spark arresting mufflers. Turning radius of 66 ft. made possible by the unique design of combined counterweight and trunnion wheel provides a high degree of maneuverability. Truck has wheel base of 45 in. with an overall length, not including load arms, of 71 in. and an overall width of 36 in.—**Willamette Hyster Co.**, Portland (8), Ore.

ADNUN

LAY WORLD'S TOUGHEST TRACK

Track layout showing pavement
varying from 30' to 60' wide.
Super elevation on curves.
Each tank runs 50 miles at
speeds up to 30 M.P.H.



Tanks are tested day and night. Flexible bituminous pavement adjusts itself to heavy blows of treads without break in pavement.

Adnun laying last of four courses each 1½" thick and 10' wide on stabilized base. No forms needed. Parallel strips firmly compacted together.

Thirty-ton tanks, grinding their macerating way around and around the Chrysler testing track in Detroit, reduced to rubble all roads until one of asphaltic concrete was built last year. It has proved to be resilient and rugged enough to withstand the heavy blows of the treads without permitting a break in the pavement, standing up where all others failed.

Two Adnun Pavers put down the 6-in. black top surface on this toughest of tracks—30,000 sq. yds. (9,000 tons) of hot-mix, hot-laid asphaltic concrete—in four courses of 1-1/2 in. each. Results proved again the quality of Adnun work—maximum density, tight joints between strips, smoothest finished surface, all-weather durability against either rubber-shod or steel-shod treads.

Adnun Black Top Pavers were the first in the field. They are the first in performance today. Continuous Course Correction, an exclusive Adnun feature, makes it possible to lay each course more smoothly than the preceding one. This gives better material control and insures maximum density in the pavement. Overlapping action at the Cutter Bar assures a tight joint at the curb or against the paralleled course, thus making forms unnecessary.

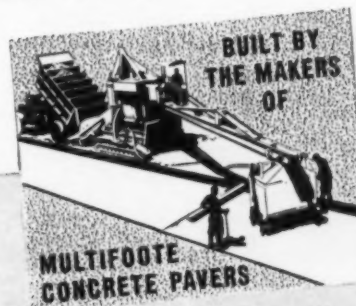
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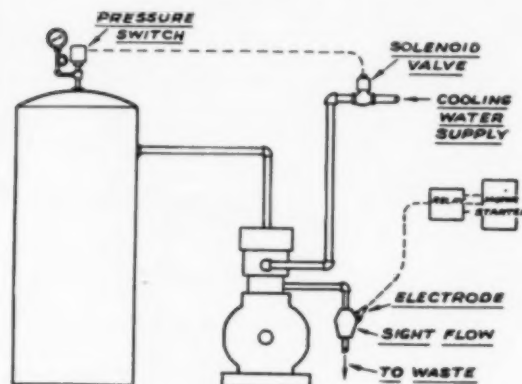
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INSLEY MANUFACTURING CORPORATION

INDIANAPOLIS 1, INDIANA

COMPRESSOR CONTROL for water-cooled units prevents overheating damage and waste of water by permitting compressor to operate only when water is actually flowing through it. Consists of a sight flow fitting mounted in water discharge pipe of compressor which serves as holder for metal electrode. When pressure in receiver falls below pre-



determined level, pressure switch on receiver opens a solenoid controlled valve to admit cooling water to compressor. Compressor is not started until water flows through it and in to sight flow, completing circuit with electrode. If for any reason water supply fails, compressor will not be started, or if operating, will be stopped immediately. This arrangement is designated as Type M (shown in photograph). New control is also available as Type U for use on unloading compressors. It assures a flow of cooling water before compressor starts and stops compressor or sounds warning alarm if water supply fails. It can be used on compressors of all sizes and can be adapted to practically all operating conditions.—The Johnson Corporation, Three Rivers, Mich.

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Design and engineering staffs are integral parts of Timber Structures offices in New York, Portland, Seattle, and San Francisco.

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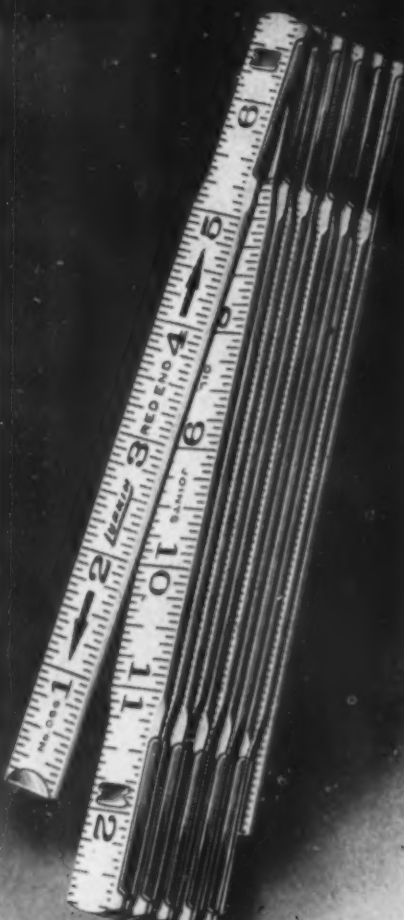
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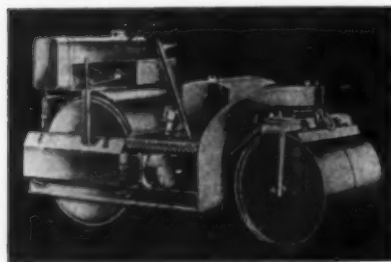
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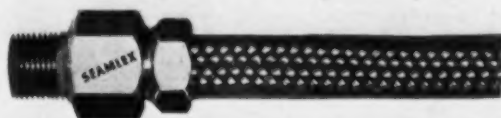
equals that of machines not similarly equipped. When arc is extinguished, device automatically reduces voltage to 40 v. Provided with special moisture-proof insulation throughout. Other features: wide current range, high electrical efficiency, improved power factor and easy maintenance. All parts protected by heavy coating of moisture-proof paint.—Wilson Welder & Metals Co., Inc., 60 E. 42nd St., New York (17)-N. Y.

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PLASTIC RESIN BOARD, now being used successfully by both Army and Navy, will probably find many post-war uses in construction lines, including wall paneling, flooring, table tops and housefurnishings, according to its makers. This board is washable, and is not affected by gasoline, oils, acids, most alkalis or alcohol. Advantages: light weight—half of that of aluminum; great tensile strength; ability to withstand strains and excessive vibration. Can be made highly decorative.—United States Rubber Co., 1260 Sixth Ave., New York City.

★ ★ ★

DETACHABLE TYPE FITTING, 3/4-in. I.D., for flexible metal hose, has been added to Seamlex "D.T." line. These fittings, consisting of three



parts, provide triple safety against leakage due to its metal-to-metal seat, its concentric guide (maintains tube in correct central alignment) and the automatic stop which prevents stripping thread and damaging tube. Especially recommended for all-around efficiency and economy at temperatures above 250 deg., F.—Seamlex Co., 27-27 Jackson Ave., Long Island City, L. I., N. Y.

Steel cavern for a 600 mile wind

YOU ARE LOOKING into the throat of the highest-velocity* wind tunnel in the world. Air speed through the test chamber often reaches that of a bullet—about 600 miles per hour.

In order that aerodynamic research at this speed be valid, it is necessary that the tunnel itself—contours, supports, welds and surfaces—be made with unusual precision. Thus the structure, built for the Na-

tional Advisory Committee for Aeronautics, is tangible evidence of Consolidated Steel craftsmanship—the kind of work that has won and is winning every basic government industrial award. The kind of work, furthermore, that will be redevoted one day to the steel fabrication and construction needs of a peacetime America.

*As large as 16 foot throat diameter

BELOW is a rough overhead view of the high speed wind tunnel. Air is activated by two powerful fans at (A). Baffle plates (B) direct the motion and minimize turbulence. From a velocity of about 50 m.p.h. at (C), the air is pressed and drawn through the throat (D) at some 600 m. p. h. and returned to the fans for continued impetus.

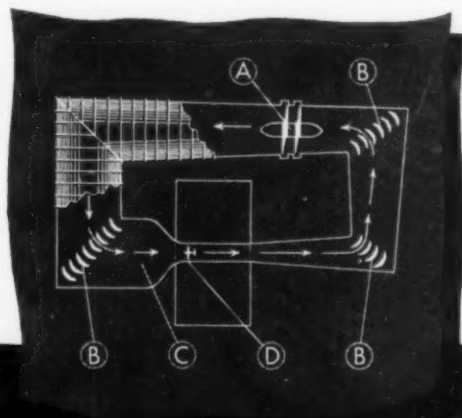


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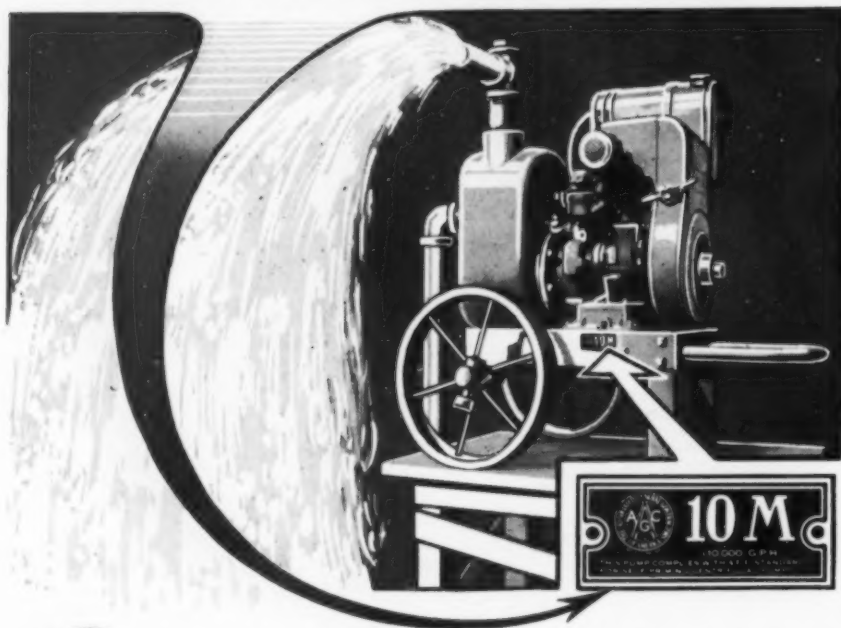
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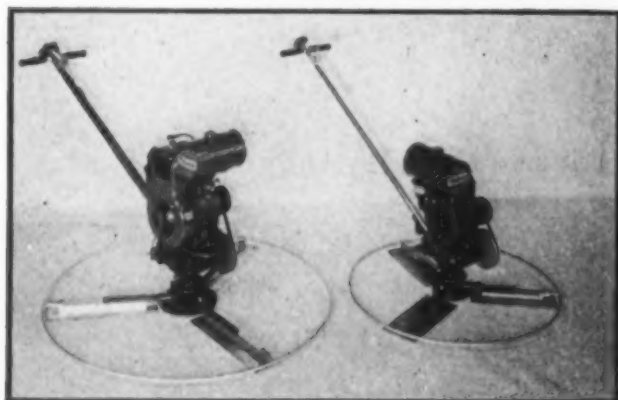
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New

A Lightweight
Small Diameter
WHITEMAN
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Designed specifically for small areas, the Whiteman Model "J" Concrete Finishing Machine (shown above right) reduces costs on small concrete floating and finishing jobs, produces stronger, better finished concrete surfaces. This new lightweight float and finisher, with interchangeable trowels, provides all of the economies of the Standard Model B Whiteman dual-purpose floating and finishing machine (shown above left)—adds four features:

1. EASY OPERATION, small size enables even inexperienced operator to handle with ease. One man can cover 750 sq. ft. in 15 minutes.
2. SMALLER DIAMETER TROWEL (only 34") permits operation in small, crowded areas, even around pipes and similar obstructions.
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4. LOW COST makes this a profit-producing investment for even the smaller contractor.

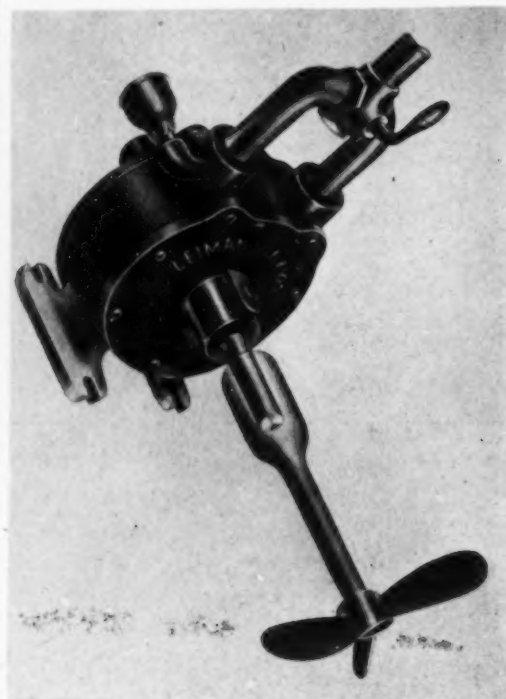
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★ ★ ★

ARMY "CRASH" TRUCK equipped with Hercules split-shaft power takeoff in drive shaft is now in use at airfields to smother flames resulting from crash landings of aircraft. In actual use pump on truck delivers water from its 1,000-gal. tank at rate



of 300 gal. per min. and at three times pressure of ordinary fire engines. Pressure produces dense fog which, when distributed through turret guns, blasts away flames and smoke. By installation of power takeoff in truck Army engineers found that full power of truck motor could readily be transmitted to pumps, thus eliminating need for special motor and saving weight and space.—Hercules Steel Products Co., Galion, Ohio

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The cord bodies of Firestone Off-the-Road tires are stronger because they are made of special high tensile cord, Gum-Dipped and specially processed for extra strength. Four extra tread plies cushion the body against impacts. The cord body is further protected by specially compounded, cut-resisting treads and double-thick sidewalls.

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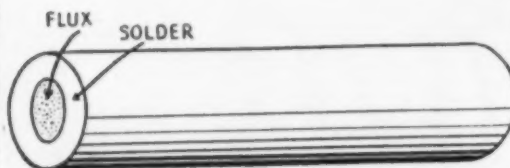
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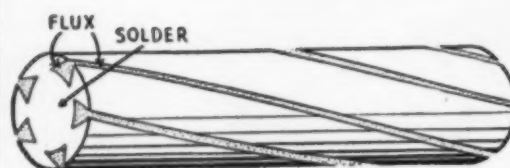


Illinois

FLUXED WIRE SOLDER containing flux in longitudinal grooves on surface rather than in conventional core is said to overcome inherent disadvantage of regular cored solders which supply flux and solder to surface simultaneously. Since



CONVENTIONAL FLUX-CORE WIRE SOLDER



NEW TYPE OF WIRE SOLDER WITH FLUX IN GROOVES

flux in new product is outside rather than inside, it liquifies and flows on to work before solder melts, insuring thorough and complete fluxing and resulting in stronger and better solder joints. New solder also claimed to guarantee unbroken flow of flux. Additional advantage: flux supply being outside of wire is always visible to user and can be checked quickly and readily. Available in same diameters as regular solder and in two compositions designated "Red Stripe" and "Green Stripe" these designations referring to color of flux which has been dyed these colors for easy identification.—National Lead Co., 111 Broadway, New York (6), N. Y.

★ ★ ★

IMPROVED BRAKE LINING for external brakes, known as Gatke External Dura-Blok Brake Lining, is used in many instances to replace woven brake lining of which there is a critical scarcity due to



war production requirements for woven asbestos materials. Rolls of this molded brake lining with wire back reinforcement are obtainable in a complete range of sizes up to 3/4 in. thick by 6 in. wide. This lining for internal type (expanding) brakes has long been available in similar range of sizes.—Gatke Corporation, 228 N. La Salle St., Chicago (1), Ill.

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A TOUGH MACHINE FOR ROUGH COUNTRY



LATEST MODEL T-6-K MICHIGAN

A sudden slide—and a vital California mountain highway was blocked by 100 tons of rock. This veteran $\frac{3}{4}$ yard MICHIGAN Shovel sped to the job. Minutes later, traffic resumed... Highway maintenance is important war work—and Michigan Shovels and Cranes are proving themselves even more than ever before.



$\frac{3}{4}$ yd. and $\frac{1}{2}$ yd.
models. Conver-
tible to Shovel,
Crane, Clam,
Dragline, Trench
Hoe. Write for
Bulletin CM-54.

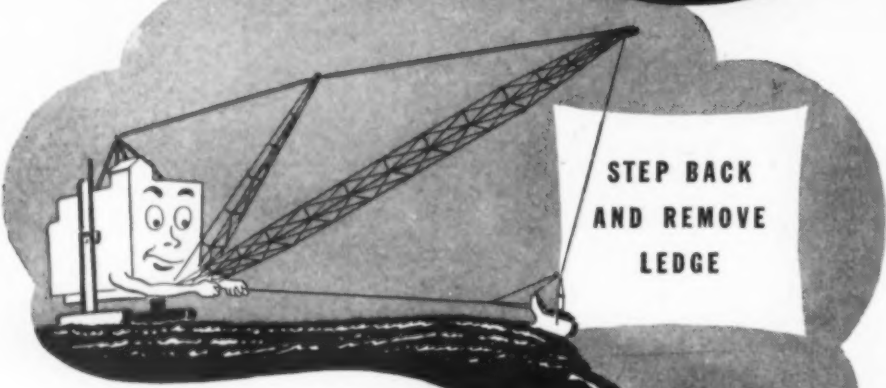
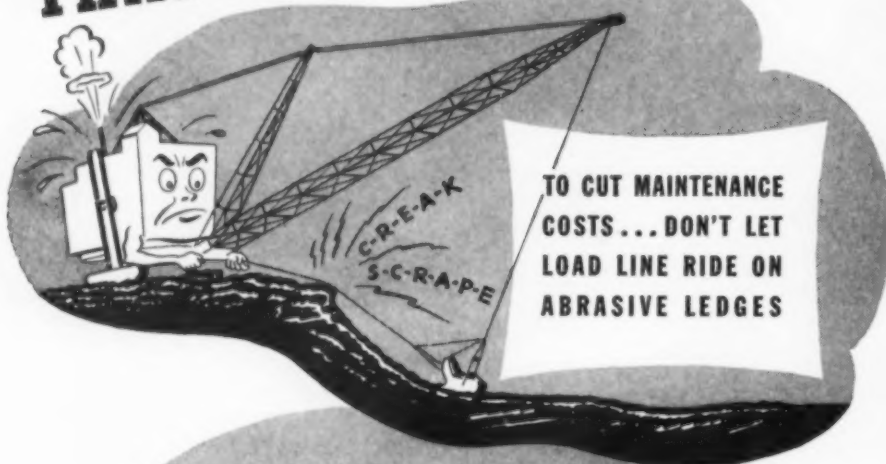
MICHIGAN

POWER SHOVEL COMPANY

BENTON HARBOR MICHIGAN

**DRAGLINE
PRODUCTION TIP
NO. 4**

REMOVE LEDGES THAT WEAR THE CABLES!



Experience by hundreds of dragline owners, on every type of work and under all conditions, has proven that size for size and weight for weight — a Page Automatic Dragline Bucket outdigs any other bucket made!

PAGE

Automatic DRAGLINE BUCKETS

PAGE ENGINEERING COMPANY, CHICAGO 38, ILLINOIS

ALL-PLASTIC GOGGLE, called "Eye Savers", has one-piece lens of shatterproof methacrylate that withstands heavy impact and is said to be highly resistant to pitting caused by sparks. Curved



plastic frame fits face snugly and shields eyes from every angle. Unique construction permits easy replacement of low-cost lens. Non-fogging. In writing for information, mention Model 7.—Watchmoke Optical Co., Inc., Providence (3), R. I.

Save money with accurate construction estimates

You know how much in profits it would mean to you to have more accurate estimates with less discrepancy between estimated and actual costs—how much in business gained by closer bidding. Now, this book helps you achieve these results. It will pay out further in time saved, by helping you to get accurate estimates more quickly and easily.



H. E. PULVER'S

Construction Estimates and Costs

653 pp., 6 x 9, many diagrams and tables, \$5.00. Takes up each step of construction work separately—from first investigation to final, detailed estimates—and provides simple, arithmetical methods of accurately estimating costs. Covers estimating with both tables and diagrams and includes specimen tables and diagrams. Both diagrams and tables show variations in quantities as well as in prices of material and labor. Worked-out estimates for typical jobs show application of methods.

EXAMINE IT 10 DAYS — MAIL COUPON

McGRAW-HILL BOOK CO., INC.,
330 W. 42nd St., New York 18, N. Y.

Send me Pulver's Construction Estimates and Costs for 10 days' examination on approval. In 10 days I will send \$5.00, plus few cents postage, or return book postpaid. (Postage paid on cash orders.)

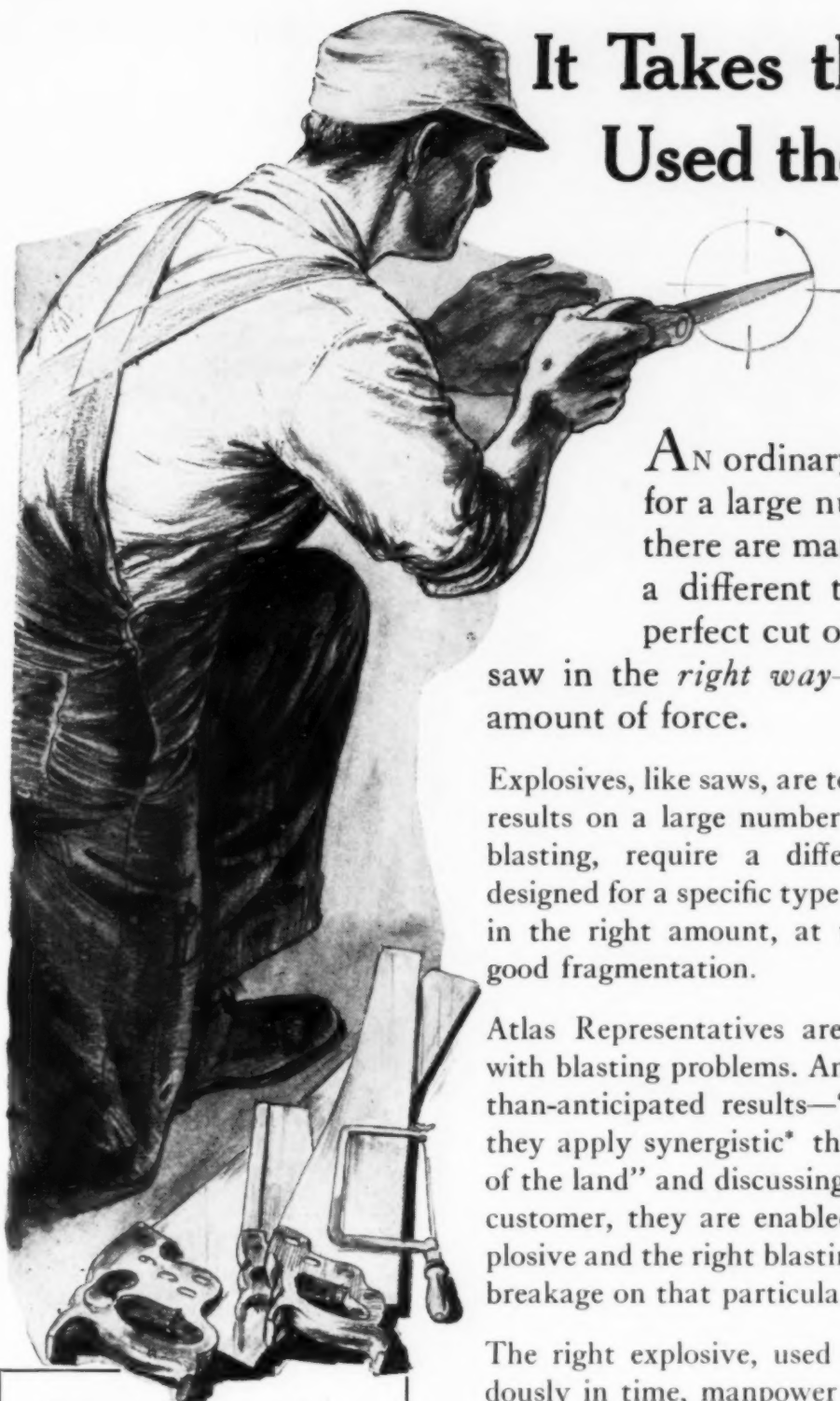
Name

Address

City and State

Position

Company C. M. 5-44



It Takes the Right Saw Used the Right Way!

AN ordinary crosscut saw can be used for a large number of sawing jobs. But there are many kinds of saws—each for a different type of job. You get the perfect cut only when you use the *right* saw in the *right way*—and apply just the right amount of force.

Explosives, like saws, are tools. Some explosives give good results on a large number of jobs. Other jobs, for good blasting, require a different explosive—an explosive designed for a specific type of shot. Use the *right* explosive in the right amount, at the right place—and you get good fragmentation.

Atlas Representatives are constantly aiding customers with blasting problems. And to give the customer better-than-anticipated results—"2 plus 2 equals 5" results—they apply synergistic* thinking. By analyzing the "lay of the land" and discussing ideas back and forth with the customer, they are enabled to recommend the right explosive and the right blasting formula for the best possible breakage on that particular job.

The right explosive, used the right way, saves tremendously in time, manpower and equipment use.

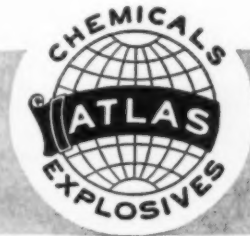
***Synergism:** The force that produces "2+2=5" results when both you and we get together and really "click."

Have YOU a blasting problem you'd like us to tackle? Consult Atlas.

ATLAS

EXPLOSIVES

"Everything for Blasting"



ATLAS POWDER COMPANY, Wilmington 99, Del. • Offices in principal cities • Cable Address—Atpowco



★★ Immediate delivery on Gasoline Powered 1½ H.P., and wheelbarrow or round base mounted 3 H.P. units on suitable priority.

Complete catalog of MALL Gasoline Powered, Pneumatic and Electric Vibrators, Portable Electric Circular Saws, Gasoline Engine and Pneumatic Chain Saws, Surface Planes and Electric Drills mailed upon request.



3 H.P. Gasoline Powered Unit Placing a Stiff Mix Concrete

Contractors—make the most of time, men and materials, get a stronger, better watertight job, and eliminate power line installation costs and worries with a MALL Gasoline Powered Vibrator.

These units are easily moved anywhere on the job by one man, operate all day on 1½ to 2 gallons of gasoline, start quickly in all temperatures, and require little attention. In addition, the variable speed gasoline engine supplies abundant power for 8 other interchangeable tools.

These advantages plus many others make MALL VIBRATORS indispensable to handle Wartime work and to meet post-war competition. Write at once for full details. You'll be money ahead with a MALL Vibrator.

MALL TOOL COMPANY

7757 SOUTH CHICAGO AVE., CHICAGO 19, ILLINOIS

Offices and Distributors in Principal Cities

NEWS FROM

MANUFACTURERS

About Their Products

The publications reviewed below will keep you posted on latest developments in construction equipment and materials available for your use.



MANGANESE STEEL FOR CLAY PRODUCTS INDUSTRY—American Brake Shoe Co., Chicago Heights, Ill. (30 pp. illustrated) This catalog demonstrates by word and picture the uses of manganese steel for excavating, hauling, crushing, mixing and manufacturing equipment and the reason it is desirable to specify this steel in ordering machinery for clay production. Photos and

description of manganese steel parts for pug mills, shale planers, gyratory and roll crushers, pulverizer parts and sheave wheels. Two pages devoted to description of manganese steel wheels and welding materials for reclamation and hard facing.

★ ★ ★

JACKS—The Duff-Norton Manufacturing Co., Pittsburgh, Pa. (28 pp., illustrated) Features, with appropriate job illustrations, company's wide line of jacks for all jobs of lifting, lowering, pushing and pulling such as automatic lowering jacks, general purpose jacks, journal jacks, ball-bearing bridge and wrecking jacks, self-lowering, speed-controlled foot-lift jacks, self-lowering governor controlled jacks, push and pull jacks, air-motor-operated power jacks, mine roof jacks, airplane wing jacks, automatic lowering cable reel jacks, telescope screw jacks, screw-type cable reel jacks, Barrett trip or track jacks and Barrett oil well jacks. These jacks are manufactured in a wide variety of types and sizes and in capacities to suit every need.

★ ★ ★

USES OF CALCIUM CHLORIDE—Wyandotte Chemicals Corp., Wyandotte, Mich. (13 brochures) During the last year this company has issued a completely new list of promotional circulars on uses of calcium chloride. Subjects treated: Utilizing this chemical by our armed forces; for year 'round tractor tire ballast; for dustproofing, fire protection, ice control, prevention of refrigeration breakdowns; for use around home and farm; to keep coal from freezing; for melting skidproof icy surfaces; for production of better concrete; for use in making posters stick to billboards in icy weather; for stronger and higher quality concrete products at reduced cost. Eight important uses for calcium chloride covering some of the foregoing subjects are listed in a separate brochure.



HIGHWAY STEELS



WIRE MESH

Slab reinforcement keeps cracks closed and holds slab together.



DOWEL SPACERS

Assures correct alignment and simple installation of shear dowels.



CENTER JOINT

For controlling longitudinal cracking of pavement.

Specify Them!!

REPORTED HIGHWAY RESEARCH INDICATES STEEL REINFORCEMENT IS NECESSARY IN PAVEMENTS FOR LONG LIFE AND LOW MAINTENANCE.

LACLEDE STEEL COMPANY

ST. LOUIS, MISSOURI



POWER TO WAGE WAR AND TO SERVE PEACE

FROM the very beginning, GM Diesels have been tested in the crucible of war. They power tanks, heavy gun tractors and bulldozers; submarines and subchasers; invasion boats and lighters. And everywhere, always, these weapons are proving worthy of the fine fighting men who are using them.

That is because GM Diesel operation is based on simple and sound mechanical principles. GM Diesel construction is exceptionally strong and uniformly precise—the way General Motors always builds.

When normal life and living are resumed, GM Diesels will be as ready to step back into private life and resume service in peace as they were to go to war. And you will find them as capable of sure, reliable, low-cost performance on the toughest jobs at home as they are on fighting fronts the world over.



America's farms are going to need GM Diesel power for their tractors. This sure, reliable, low-cost source of power will go far toward solving some of the farmer's most vexing problems. And not the least of these problems is to get more work done, faster and at lower cost in labor and mechanical power. GM Diesels will help.



ENGINES...15 to 250 H.P... DETROIT DIESEL ENGINE DIVISION, Detroit, Mich.

ENGINES...150 to 2000 H.P.....CLEVELAND DIESEL ENGINE DIVISION, Cleveland, Ohio

LOCOMOTIVES.....ELECTRO-MOTIVE DIVISION, La Grange, Ill.



**CALLING ALL
CONTRACTORS!**

**CALLING ALL
READY MIX PLANTS!**

CUT COSTS by Handling Bulk Cement the ROBINSON Way



WHAT is the "Robinson" way? It's the "Air-Activated" way. Cement in batches is fluffed up and then passed through the pipe to storage or mixing plant. The whole system is so simple. There are no continuously moving parts to get out of order or cause high maintenance, such as illustrated above.

Many contractors are using or have used the Robinson system for conveying bulk cement on jobs from siding to storage silo or plant. It has been used on some of our most important constructions such as several TVA Dams; Tygart River Dam in West Virginia; Norfolk Dam in Arkansas.

*Write us about your next job where you plan
to convey cement in bulk.*

ROBINSON Air-Activated Conveyor Systems

Division of MORSE BOULGER DESTRUCTOR CO.

205 EAST 42nd STREET

NEW YORK 17, N. Y.

Representatives in All Principal Cities

5-MB-1

MODERN MATERIALS HANDLING MACHINERY—The Yale & Towne Manufacturing Co., Philadelphia Division, Philadelphia (24) Pa. (124 pp., illustrated) This book has been prepared as an aid to American industry and management in making the fullest use of modern materials handling machinery. Explains by verbal description and sketch how materials are received in the modern plant, demonstrates the two fundamental materials handling motions, horizontal and vertical, and explains how efficient machinery for this purpose speeds production and saves manpower. Other subjects treated: Importance of skids and pallets in efficient materials handling; self-loading power trucks; low-lift platform trucks; self-loading high-lift platform trucks; self-loading high-lift fork trucks; trailer trains; load carriers; self-loading ram trucks; crane trucks; hoisting equipment for vertical and horizontal materials movement; and how to apply hoisting equipment. Ninety-six pages are devoted to a pictorial review of Yale & Towne materials handling machinery serving American industry in the metal, transportation, process, food, warehousing and other fields. The last three pages list in concise form broad extent of Yale line with view to helping interested readers effect permanent reductions in handling costs to lowest practicable level.

★ ★ ★

DYNAMITE CARTRIDGE COUPLING—Hercules Powder Co., Wilmington, Del. (14 pp., illustrated) Booklet explains advantage of using "Spiralok,"



first cartridge with the spiral thread, in seismic exploration and in blasting river crossings for pipe lines. Widely used in seismic work, Spiralok also has proved its usefulness to pipe liners and dredge-boat operators by saving time, promoting safety and making good breakage certain. Consists of dynamite packed in a strong paper shell equipped with a spiral thread. This shell screws into a stout spiral-grooved sleeve. In loading, a sleeve is screwed over the two halves of adjacent cartridges until they butt together. The cartridge provides a strong rigid column and makes unnecessary stringing, lathing, taping and pegging and saves loading time, reduces operating costs and lost and broken charges, according to its manufacturers.

★ ★ ★

LIFT TRUCK OPERATORS GUIDE—Towmotor Corp., 1226 E. 152nd St., Cleveland 10, Ohio. (24 pp., illustrated) Interprets to industrial truck operators importance of materials handling function and emphasizes increasing variety of tasks that are being given lift trucks in present-day handling systems. Is designed to increase skill of both veteran operators and new men. Special attention is given to fast, efficient maneuvering, as well as safe and time-saving operating methods. Other sections emphasize by simple illustrations typical load-carrying devices and methods of stacking. Safe, space-saving methods of building unit loads are clearly and quickly shown in pictorial form. There is also check list of "Do's and Don'ts" for safety as well as one covering operating care of lift truck. Operating instructions in simplified form are given for starting, shifting gears, steering, lifting and tilting. Charts give picture of Towmotor control for each operation. Guide is also available in condensed form from which specific Towmotor operating instructions are omitted.

AIR-ENTRAINING CEMENT REQUIRED FOR ALL STATE CONCRETE HIGHWAYS IN METROPOLITAN CHICAGO



Test installations on South Archer Avenue, Chicago, laid in 1941 and photographed in 1943. Left: eastbound lane placed with Atlas Duraplastic is practically scale-free. Right: westbound lane placed with normal portland cement shows scaling after two winters of identical salt de-icing treatments.

Atlas Duraplastic* proves scale-resisting value of air-entraining portland cement on test pavement installation

Archer Avenue, the main highway from downtown Chicago to the municipal airport, was chosen by the Illinois Division of Highways for a test installation of air-entraining portland cement. The results of two winters' exposure to heavy applications of de-icing salts (pictured above), show how Atlas Duraplastic met the test. Duraplastic pavements in other states and cities have uniformly duplicated results of this test.

Some of these installations are now in their fifth winter, and all are practically scale-free.

Atlas Duraplastic is a true portland cement in which a small quantity of air-entraining material, in an amount precisely determined for uniform performance, is interground during manufacture. Its effectiveness in protecting concrete against the effects of freezing and thawing weather and against scaling due to salts used for ice

removal is the result of more than eight years of research and tests by Universal Atlas in the laboratory, in the plant and on the job.

For reprints of articles from technical journals and for detailed information on Atlas Duraplastic, write to Technical Service Bureau, Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Bldg., New York 17, N. Y.

. . .

OFFICES: New York, Chicago, Albany, Boston, Philadelphia, Pittsburgh, Minneapolis, Duluth, Cleveland, St. Louis, Kansas City, Des Moines, Birmingham, Waco.

CM-D-5

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ATLAS DURAPLASTIC CEMENT

A Universal Atlas Product



"Take it from me — the next time I buy a wheelbarrow it's going to be one of those modern Easy-Wheeling STERLINGS. I've pushed and tugged away at this old jalopy long enough. I've learned the hard way that —

IT ALWAYS PAYS TO BUY THE BEST"

Sally has the right idea. Invariably it pays to spend a few dollars more for the best equipment available. That's why Sterling Wheelbarrows are in such great demand! Regiments of sturdy Sterlings are helping Uncle Sam speed Victory . . . more will be available in the postwar era.

Sterling Wheelbarrow Co.
Milwaukee 14, Wis., U. S. A.



Sterling Model S18 with 12-spoked wheel, and V-shaped tray braces.

Sterling
Look for this Mark of Sterling Quality
WHEELBARROWS

ADJUSTING SAFETY GOGGLES—American Optical Co., Southbridge, Mass. (16 pp. illustrated) Booklet entitled "Right on the Nose," explains in detail quickest and easiest methods of adjusting non-prescription industrial safety goggles so that workers can wear them in comfort. Prepared for safety directors, medical directors and other persons assigned job of fitting goggles. Object of booklet is to help prevent eye accidents caused by workers refusing to wear safety goggles because they are improperly fitted and therefore uncomfortable to wear. Training film, 16 mm., on same subject and bearing same title as booklet is available for loan by those interested. Free copies of the booklet may be obtained upon request.

★ ★ ★

WIRE ROPE BUYERS' GUIDE—MacWhyte Co., Kenosha, Wis. (160 pp. illustrated) Tab-indexed catalog contains latest tables and information in accordance



with new simplified practice on wire rope issued by National Bureau of Standards, United States Department of Commerce, and developed in collaboration with engineers of wire rope industry. Sections devoted to uses of various kinds of preformed and non-preformed ropes, aircraft cables, non-corrosive and galvanized wire ropes, slings, fittings and lubricants. Minute directions are

given for making out rope orders properly. Sixty pages list helpful methods on care and conservation of rope. Glossary of wire rope terms in every day use. This catalog is available to those who find use for it, provided they write request on company letterhead.

★ ★ ★

PORTABLE SAW—DeWalt Products Corp., Lancaster, Pa. (6-p. brochure, illustrated) Describes and illustrates salient features of portable power unit available in capacities of from 1½ to 3 hp., equipped with direct drive motor standard a.c., 60-cycle, 3,600 rpm. (idle) and 3,425 rpm. (load) and with ball-bearing carriage to assure ease of operation. Lists advantages: Unusually low cost; quick change from stock to rip saw, dado machine, spindle shaper to meet seasonal or pattern changes; precision accuracy — saw travels on accurately machined tracks inside arm; straight line production—no stoop, no squint to setup; dependable all-purpose unit—for small shop it is said to save in equipment necessary to render maximum service, and for large plants it serves as quickly setup emergency machine.

★ ★ ★

TRACTOR-SHOVEL—The Frank G. Hough Co., Libertyville, Ill. (4-p. folder, illustrated) Describes the "Payloader", 1-cu. yd. unit, said to be ideal for material handling or construction work at airports, army camps, ordnance plants, public utilities, municipalities, highways and all commercial plants where bulk materials must be loaded, moved or handled on a production basis. Machine is exceptionally versatile, according to its makers, is properly balanced, powered on large rear wheels, and is a rugged digger and fast loader. Many of the jobs for which it was designed are illustrated in the folder which will be mailed on request.

National Carbide FLOODLIGHTS

VALUABLE IN PEACETIME



A
NECESSITY
NOW!

FOR ALL PURPOSES
WHERE FLOODLIGHTS
ARE REQUIRED.

Simple in Construction
Economical in Cost
Dependable in Operation

Available in 1500,
8,000 and 16,000
candlepower units.

Write today for literature
showing entire
lines of Floodlights
and Lanterns.

**NATIONAL
CARBIDE CORP.**

60 East 42nd Street
New York 17, N. Y.

NC 200

BETTER BRAKE MATERIALS for BETTER RESULTS

DURA-BLOK Wire-Bark
Moulded Brake Block



GATKE
Heavy Duty
Woven
Brake Lining



GATKE Brake Blocks and Frictions — Moulded in ALL shapes and sizes to machined accuracy.

GATKE
Clutch Facings
of all types
for all
applications



GATKE High-Heat-Resisting Asbestos Brake Materials are engineered and service-proved for every brake and clutch requirement of Excavating, Road Building and Construction Equipment. Just tell us what you need.

GATKE CORPORATION

228 N. LaSalle St.
Chicago 1, Ill.

WATCH Your Lubrication!



Your present excavating equipment will probably have to last for the duration. Under pressure for more and more output in its vital service on the production front, it is operating at top capacity, — very likely three shifts per day.

Good lubrication care, more than anything else, is the most effective maintenance insurance you can obtain. Proper lubrication will extend the life of your excavator, it will avoid breakdowns, will reduce cost of operation and increase output by reducing delays.

To keep your equipment in fighting condition, do these things:

Lubricate each part regularly and thoroughly as prescribed by your manufacturer's operating instructions.

Use the **right amount** of lubricant. Too much can sometimes be harmful.

Use the **right lubricant** as specified for each fitting and part. A good lubricant when applied in the wrong place may be more harmful than none at all.

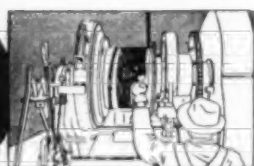
Use only **good quality** lubricants. "Cheap" oils and greases are dangerous to the machine.

KEEP LUBRICANTS CLEAN

**BUCYRUS
ERIE**

A good operator takes pride in his machine. He keeps it clean and trim and properly lubricated always. It pays off in smooth, continuous performance, maximum production, and long operating life.

HERE ARE A
FEW SPECIAL
POINTS
TO WATCH



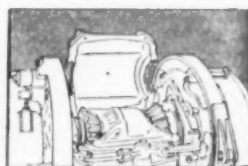
1. Ropes and drums should be lubricated regularly. Apply a thin layer often to avoid splatter in operation.



2. Be sure to lubricate the suspension ropes. They are likely to rust their strength away if you don't.



3. Lubricate cats even if machine is not propelled much, as normal digging reactions cause some wear.



4. Keep the proper amount as well as the correct grade of oil in your gear enclosures at all times.



Bucyrus-Erie

SOUTH MILWAUKEE, WISCONSIN, U. S. A.



**FOX HOLES,
PIER HOLES,
POLE HOLES**

The speedy

BUDA

EARTH DRILL

really does the job

**FOR CLEAN, STRAIGHT HOLES IN TOUGH SOIL
USE THIS MODERN EARTH DRILL
TO SAVE TIME — LABOR AND MONEY.**

BUDA

**15425 COMMERCIAL AVENUE
HARVEY (Chicago Suburb) ILLINOIS**

USES OF FRAMING SECTIONS, NUTS AND FITTINGS—Unistrut Corp., Wayne, Mich. (20 pp., illustrated) Describes and illustrates Unistrut method



of framing by which, according to its manufacturers, all types of support can be built quickly and economically. Since use of this method eliminates welding and drilling of framing members, anything built of it can be easily disassembled and quickly converted into any other kind of frame or support. Uses: framing for electrical work, such as conduit and pipe supports, concrete inserts, motor bases, bus and switch cell structures, storage racks of all types for flat material, such as steel, aluminum and wood or round material such as tires, cable, grindstones; bins for small or large parts, dies, castings; office and factory tables and benches; supports for steam, water, air and gas pipes; scaffolding; ladders; trolley beams. Explains and profusely illustrates basic principle of Unistrut as "Man-Sized Building Set," and shows scores of photographs of actual installations in wide range of industrial plants.

★ ★ ★

MAINTENANCE AND CARE OF CLAMSHELL BUCKETS—Blaw-Knox Co., Pittsburgh, Pa. (200 pp., illustrated) Is liberally illustrated with photographs and diagrams of parts and assemblies. Covers assemblies with component parts, bearings, buckets, cable life, counterweights, lips, lubrication, teeth, and cutting lips.



So long as the enemy resists.....

**THE BYERS SHOVEL WE'D
LIKE TO SHIP YOU IS HELP-
ING BREAK DOWN THAT
RESISTANCE FOR YOU.**

In the meantime, owners of current and older models of Byers shovels and cranes may depend on Byers Parts Service to help them keep present equipment working steadily and satisfactorily.

BYERS CRANES
AND
SHOVELS
RAVENNA, OHIO
DISTRIBUTORS THROUGHOUT THE WORLD

Thor AIR LINE OILERS

KEEP AIR TOOLS

*Running Smoothly . . .
Cut Maintenance Costs*



DEPENDABLE LUBRICATION FOR CONSTANT, LOW COST PROTECTION

The Thor Air Line Oiler is the most efficient and economical means for providing *constant lubrication* to all moving parts of the tool on the line. It feeds finely atomized lubricant into the air stream to reduce frictional losses and keep the machine working at highest efficiency. Operating wear is lessened to lower maintenance costs. Automatic, fool-proof, inexpensive . . . Thor Line Oilers cut your costs; give you constant protection for hard-to-get air tools.

NOW AVAILABLE for important work.
Made in one-pint capacity for large air tools
and one-half pint capacity for small air
tools. Write for details and prices.

POSITIVE! AUTOMATIC! SIMPLE!

AUTOMATIC—Place a Thor Line Oiler in the air line. Fill it . . . and forget it. Works by itself.

FOOL-PROOF—Operates perfectly in any position . . . any direction.

POSITIVE—Feeding of lubricant continues to the last drop.

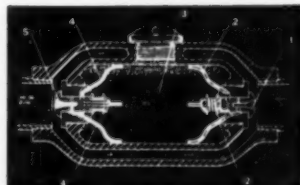
SIMPLE, SURE CONTROL—4-position nozzles are easily set to control amount of lubricant fed into air stream.

"NO-BLEED" CONSTRUCTION—Lubricant positively cannot "bleed" into air line after air is turned off.

LONG-LASTING—No moving parts, nothing to wear out. Easy to clean.

HERE'S HOW IT WORKS

Compressed air enters adjusting nozzle (1), passes through small holes into annular groove around the nozzle; out through the copper tubes (2), of which there are four; and into the oil chamber (3). The oil and air mixture is forced under pressure through the opposite four submerged copper tubes (4); out through the annular groove around the opposite adjusting nozzle (5); and into the air stream going into tool.



Thor

Portable Pneumatic and Electric Tools

INDEPENDENT PNEUMATIC TOOL COMPANY



600 W. JACKSON BOULEVARD, CHICAGO 6, ILL.

Branches in Principal Cities

**For Best Results
USE GENUINE THOR ACCESSORIES
For All Air Tools**

Tanks Speed to the Front



on ROGERS TRAILERS


EXPERIENCE
builds 'em
PERFORMANCE
sells 'em

GETTING there "fustest with the mostest" as one early American General aptly phrased it, is battle strategy that really conquers!

In the lightning speed of mechanized warfare tanks ride "Pick-A-Back" to battle on ROGERS TRAILERS so their fighting capacity is unimpaired. Special ROGERS TRAILERS retrieve disabled tanks so they can be repaired and rushed into battle again.

ROGERS TRAILERS are doing a real war job at home and abroad. New models which will be available to industry when war contracts are completed will be even better-engineered and more efficient than their predecessors.



**ROGERS BROS.
CORPORATION**
ALBION, PENNA.

Largest Shovel **Strips Coal Overburden**

(Continued from page 85)

middle of a regulation city block, it could reach over into the next block and pile earth on top of a 7-story building 240 ft. away.

The electric power required to operate this huge shovel would serve a community of 3,000 people with all of its power needs. The machine weighs 3,200,000 lb., or 1,600 tons. It required 50 railroad cars to ship.

Engineering Facts

The coal stripping shovel, with its dipper of 35-cu. yd. capacity, is designed especially for coal stripping service in heavy overburden. It follows a pattern of engineering which has proved successful on other strip operations, where several such machines have been at work either opening up new properties, or reopening old cuts deemed unprofitable with smaller equipment because of the excessive ratio of overburden to the coal.

Marion engineers have given particular consideration to the front end construction of this machine. They have reduced the weight of the boom by mounting the crowding machinery on the gantry, thus relieving the boom of the stresses and shock imposed by the crowding action. As a result, the boom is comparatively light, but with ample strength to meet the most severe digging requirements.

The "knee-action" front end, another development, permits the use of a larger dipper and greater working ranges than can be obtained when the conventional front end design is employed. Because of the movable fulcrum, which corresponds to the shipper shaft, especially favorable digging angles and a long radius of clean-up are obtainable.

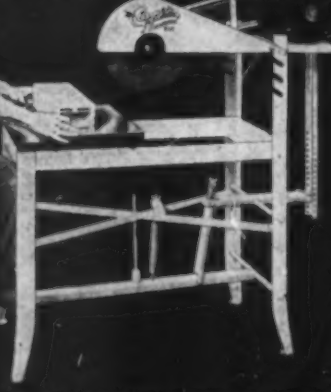
How Machine is Kept Level

Since this machine rests on the coal face in the removal of overburden and must follow the coal pitch, the question of keeping the machine level during travel and operation is of vital importance. To make sure this huge machine is level, regardless of the contour of the ground, hydraulic equalizing and leveling jacks are provided. The action of the hydraulic jack system is entirely auto-

(Continued on page 130)



Clipper **MASONRY SAWS**




A special shape or shorter length need only be as far away as your Clipper Masonry Saw. The basic feature of Clipper is the new multiple cutting principle... a method developed especially for Masonry Materials. You can be sure to cut with the fastest cutting speed and to obtain the longest blade life. Write for Catalog.

CLIPPER

MANUFACTURING CO.
4037 Manchester St. ST. LOUIS, MO.

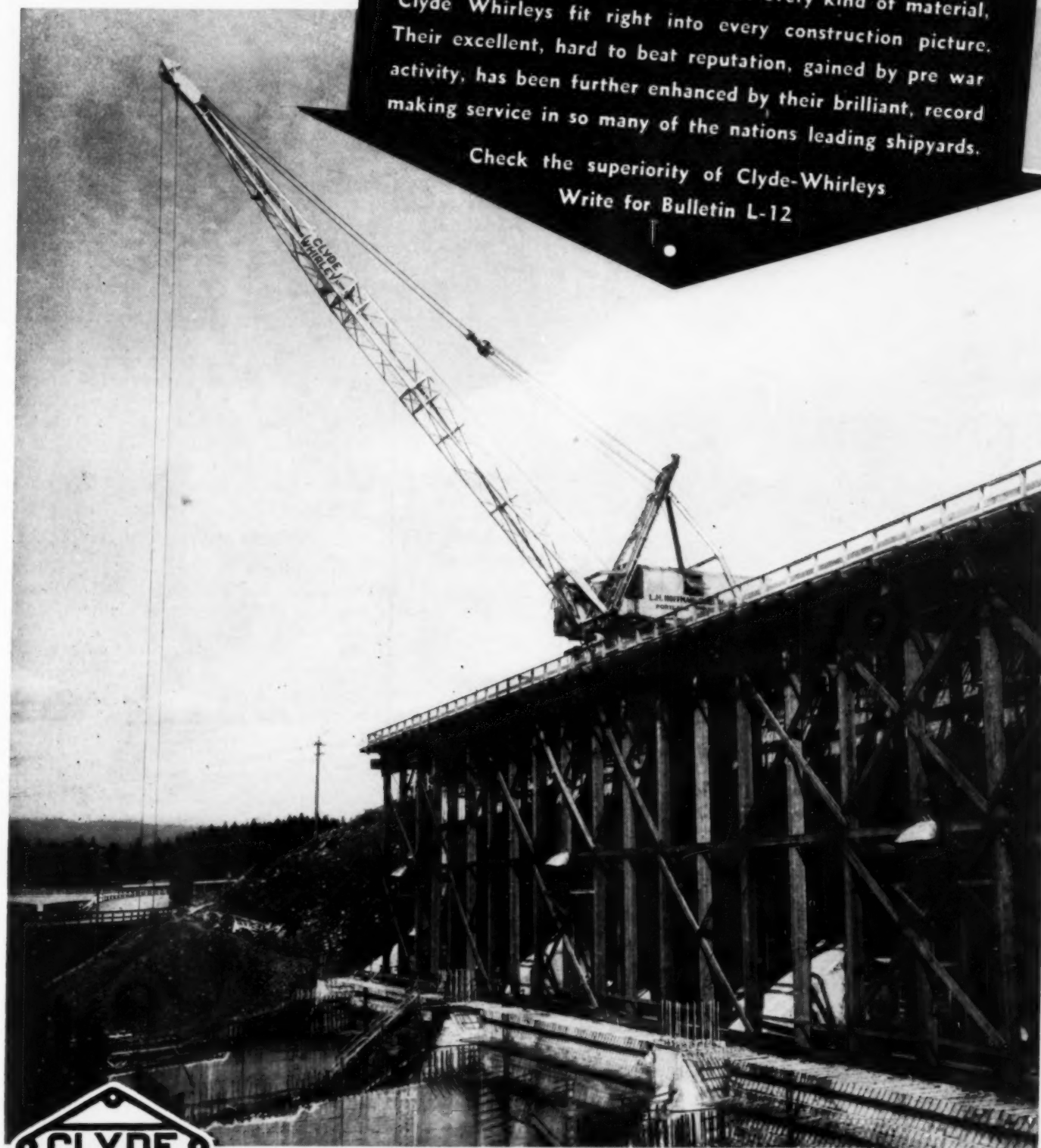
*Plan now for
the job you'll
do tomorrow!*

GOING TO BUILD DAMS?

Then check the advantage of a Clyde Whirley . . . the ideal machine for those big jobs that require fast, economical and dependable performance on every type of work.

Designed and built to handle almost every kind of material, Clyde Whirleys fit right into every construction picture. Their excellent, hard to beat reputation, gained by pre war activity, has been further enhanced by their brilliant, record making service in so many of the nations leading shipyards.

Check the superiority of Clyde-Whirleys
Write for Bulletin L-12



CLYDE IRON
DULUTH, 1

WORKS, INC.
MINNESOTA

DUFF-NORTON JACKS

BUILT TOUGH AND HUSKY FOR HEAVY DUTY ON EVERY CONSTRUCTION JOB!

Your construction equipment must be strong, tough and husky . . . it must be able to take long, hard service. That's why Duff-Norton Jacks are ideal for every construction job. They're powerfully built to give you fast, easy action under all conditions . . . And the Duff-Norton Jacks you buy now for use in war-time construction will still be giving you good service in the peacetime years to come. Specify Duff-Nortons for all your work!



Write for Catalog 202 . . . gives you complete application data, descriptions and specifications of the entire Duff-Norton line.

**THE DUFF-NORTON MANUFACTURING
COMPANY**
PITTSBURGH, PA.

Canadian Plant:
COATICOOK, QUE.

Representatives in
Principal Cities

(Continued from page 128)

matic and electrical and is positive in its action in keeping the lower frame level while traveling as well as digging.

To give this machine the greatest degree of flexibility and maneuverability, the crawlers are so arranged that the belts swivel independently, both laterally and transversely. This allows the shovel to conform to the coal surface without imposing undue strain.

★ ★ ★

U. S. S. Oklahoma

(Continued from page 73)

used for the job included a d.c. motor operating over a wide speed range in conjunction with an a.c.-d.c. generator, together with the necessary control devices such as brakes, switches, contactors, and relays. So that the pull on all parts of the vessel could be kept equalized under varying conditions, an operator was available to make quick changes in the speed of each winch, depending on the shift of the ship.

Role of Winch Motors

In a recent report on the job, Charles Stoeckly, General Electric application engineer at San Francisco, stated: "It was imperative that the winch motors be capable of the most precise individual control. It was not possible to predict the reaction of the huge vessel when it started rolling on a bottom which varied along the ship's length from semi-liquid mud to solid reef coral. Possibilities existed for rocking fore and aft, differential rolling and sliding, and changes in the center of rotation, all of which actually were encountered.

"Furthermore, the forces involved in the righting were so great that failure to control them might well complete the job the Japs began—by breaking the ship apart. It was essential that the control system be capable of responding fully and immediately to the judgment of the men in charge of the work. Given an understanding of the true problem, such a system was not too difficult to devise, but to build and supply the equipment on short notice was a task of some magnitude. D.C. machinery, which was critically scarce, had to be rounded up quickly and its characteristics altered to fit the job; control equipment had to be built from parts that were obtainable and the system had to be assembled, tested, and installed."

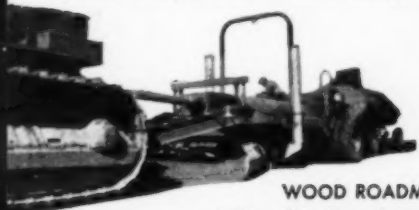
What Does a Good Highway Cost?

That depends entirely on how it is designed and built.

If it is designed for road-mix and a Wood Roadmixer, it can be built for one-third the cost of any other method of pavement construction. It will be a top-quality, long-life highway, low in first cost and low in maintenance cost.

The Wood Roadmixer is a complete traveling mixing plant. It uses local or native materials proportioned and mixed *on the job*. It produces more than 2,000 tons of mix per 8-hour day in *one pass* with a two-man crew, and handles either emulsion, road-oil or soil cement mixes. The Wood Roadmixer is the world's most versatile road-building equipment. As such, it gives free rein to the use of common sense in the design, preparation and finish of a job. That's why today Wood Roadmixers are building pavement faster, better and at less cost. And that's why they will be in even greater demand for peacetime pavement construction.

Write today for literature and prices.



WOOD ROADMIXER
A Complete Traveling Mixing Plant

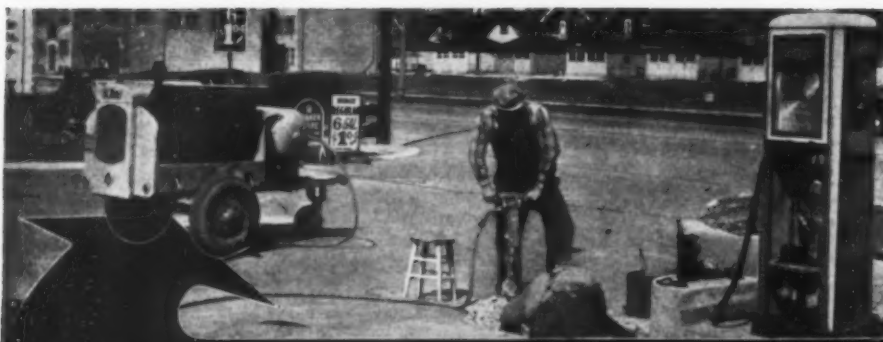
Pacific Highway, Oregon

DESIGN FOR ROAD-MIX



WOOD ROADMIXER

Wood Manufacturing Co. • 816 West 5th St., Los Angeles 13, California



There's **PROFIT** in small jobs, too — with

LE ROI Portable Air **COMPRESSORS**

Less dead time . . . more working time!

You can make money on small jobs with Le Roi portable air compressors because they have the ready mobility that gets tools into action faster. Many special features assure you of dependable, trouble-free performance, and guard against costly interruptions.

Le Roi is the only manufacturer who builds both valve-in-head engine and compressor — to give you integral design, coordinated action, and smooth-running teamwork. Le Roi Compressors are available in standard sizes for approved projects. Consult your nearest Le Roi dealer or write for bulletins.

C-40A

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Each Dipper Tooth made
GOOD AS NEW
in only **30 Seconds!**



Shovel digger teeth wear rapidly. Particularly in rocky soil and gravel where they are subjected to excessive abrasion, shock and impact.

To make the teeth of buckets more wear-resistant, to keep them sharp longer and avoid frequent replacements, many companies are relying exclusively on Coast Metals Hard-Facing. Applied to the teeth, as well as lips, runners and other parts,

it successfully protects these vulnerable points so that the bucket functions more effectively, more quickly, and at a significant saving in power. After the teeth become slightly worn, they are then given another Coast Metals Hard-Facing and once again made good as new . . . in only 30 seconds!

Coast Metals Hard-Facing meets today's needs for making all machinery, equipment exposed to severe wear last longer. Easily applied by the electric arc or gas torch to any ferrous metal including manganese steel, alloy steel, cast iron and chilled iron. New revised edition of Form X-201 goes into full detail. Write for your copy today.

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COAST METALS
hard-facing
weld rods

MAKE YOUR EQUIPMENT LAST LONGER

Municipal Post-War Construction

(Continued from page 72)

tive committees of public-spirited citizens are already at work promoting post-war construction. Because a constitutional convention is in session this year to revise the Missouri state constitution, the Citizens Post-War Construction Council through a capable legislative committee has presented amendments to facilitate municipal public works financing, which has been handicapped by outmoded limitations in the present constitution. The Missouri Municipal League has aided this effort with legal counsel, expert testimony and state-wide support.

Constitutional reform is a timely and significant activity, extremely important to the long-term future of municipal finance in Missouri. If the European war should last into 1945, the proposed amendments may even be effective in facilitating municipal financing of post-war projects. A long-delayed armistice is neither desired nor expected, and public works which are to be useful in picking up the employment lag during the reconversion period almost certainly will have to be financed under existing law. The immediate concern of the Citizens Post-War Construction Council, therefore, is with the production of working drawings and provision of funds in conformity with current constitutional restrictions. Before discussing the methods of promoting these immediate ends, it may be well to explore the size of the job.

Missouri Municipal Works

Census figures for 1940, still reasonably valid today, show that Missouri had a population in round numbers of 3,800,000, of which 1,200,000 was in the two large cities. At that time 85 other communities of more than 2,500 people had a total population of 750,000. Including the 115 additional towns of 1,000 to 2,500 population, the Citizens Post-War Construction Council is attempting to promote municipal public works for communities embracing a total of 950,000 persons. These communities, smaller than the two large cities, are chosen for attention because they are the normal providers of a substantial share of the public works budget and because they are most likely to need outside aid and advice in solving local problems which delay the complete pre-planning and financing of post-war improvement.

(Continued on page 134)

Resurfacing



Asphalt resurfacing of our highways, streets and roads, now greatly in need of attention, offers many advantages. Dangerously cracked and broken pavement is restored to a safe surface. Practically no engineering time is required. Operations can be started immediately and completed within a short time.

Savings are effected through utilizing the old base, eliminating the cost of new construction. Leveling arms smooth out uneven base surfaces.

Using the Barber-Greene Tamping-Leveling Finisher, only a minimum operating crew is required.

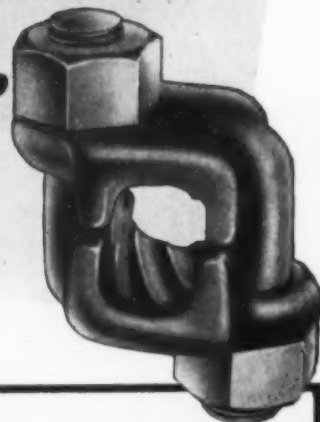
There is little traffic interruption as the Barber-Greene lays one ten to twelve foot lane at a time. Because of the tamping action, material is compacted immediately behind the machine so that rolling can progress right up to the Finisher.

For further information on the B-G Finisher and its availability now, write Barber-Greene Co., Aurora, Illinois, U. S. A.

44-7

BARBER-GREENE
A U R O R A I L L

"FIST-GRIP" CLIPS HELP MAKE "FIRST CLASS" WORKERS



3 ADVANTAGES OF "FIST-GRIP" CLIPS

1. **Saves Manpower**... less work to apply, fewer clips to apply.
2. **Saves Metals**... 25% fewer clips do the job better, saving steel; no crushed rope ends, saving rope; no battered threads... nuts are flush.
3. **Saves Time**... fewer clips speed the job; nuts on opposite sides—easier, faster tightening with any type wrench.

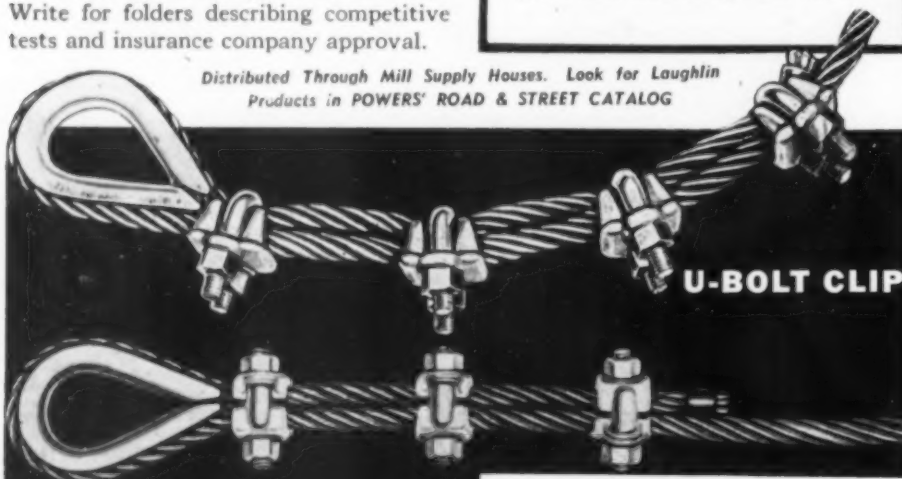
Congratulations to you men in charge of safety programs. You've done a remarkable job in these abnormal times.

Laughlin "Fist-Grip" Safety Clips fit right in with your plans. Even green men work safely with them.

The extra safety provided in Laughlin "Fist-Grip" Safety Clips helps inexperienced workers to do faster work with fewer accidents. They can't be put on backwards, because their saddles are identical... 100% foolproof.

In every sort of test by major rope companies, leading technical laboratories and in actual use by well-known industrial, contractors, etc., Laughlin's "Fist-Grip" Clips have proved their rope and labor-saving features *plus* extra safety. Write for folders describing competitive tests and insurance company approval.

Distributed Through Mill Supply Houses. Look for Laughlin Products in POWERS' ROAD & STREET CATALOG



"FIST-GRIP" CLIP

Fewer Safety Clips hold rope straight in smooth, vise-like grip.

FORGING A SHARE IN VICTORY

SAFETY
EYE HOOK



SAFETY
SHANK HOOK

LAUGHLIN HOOKS ARE ALSO MUCH SAFER

These rugged hooks with their stout-springed latches securely trap the slings... no accidental slipping or jolting off.

**THE THOMAS
LAUGHLIN**



Company
PORTLAND 6, MAINE

(Continued from page 132)

provements. Although efforts are directed primarily to the towns, the effects overflow into the surrounding counties and produce a similar result in expediting blueprints for county work.

In normal times state and municipal work furnishes about 35 percent of the volume of engineered construction in the United States. Engineered construction represents roughly two-thirds of the total volume of all construction in the country. Thus, if we accept 15 billions as the desirable annual budget of construction after the war, 10 billions is the amount to be expected of engineered projects. On a normal basis, 3½ billion of this construction would be financed by municipalities and states. If half of the state-municipal budget is assigned to municipalities, one arrives at a yardstick value of 1¼ billion in one year for municipal works to be built almost entirely by the 4,282 incorporated places of 1,000 or more population in the United States. The total population of these places in 1940 was nearly 80,000,000, and the per capita volume of municipal construction in a post-war year therefore would be about \$22.

Outside its two large cities, as previously mentioned, Missouri has 200 such places, with a population of 950,000. At \$22 per person, these places ought to have ready in advance the plans, specifications, sites and funds for \$21,000,000 worth of post-war construction. The Citizens Council will not rest until this minimum volume of municipal construction is ready to be advertised for bids.

No Federal Aid

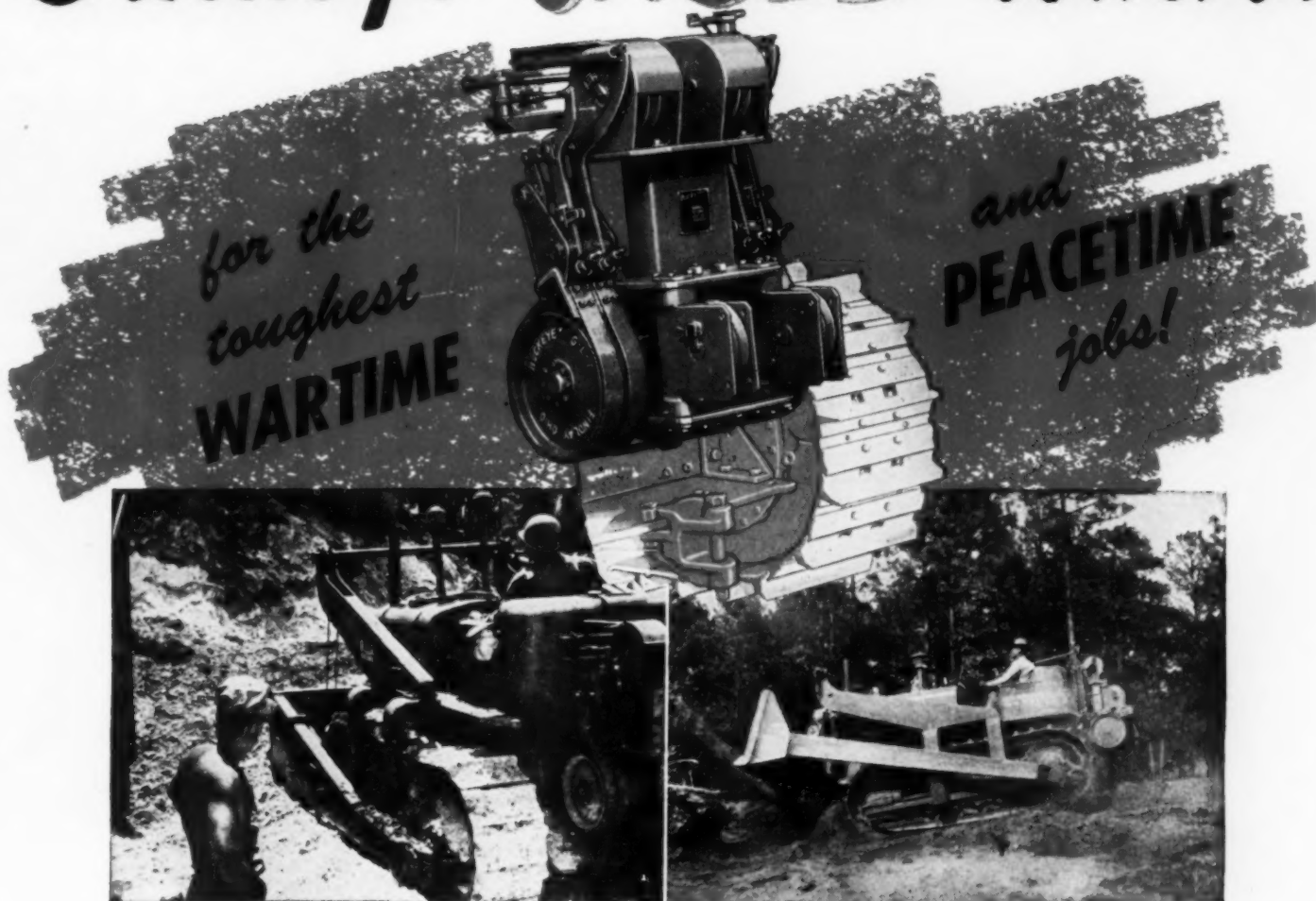
As indicated by part 6 of the accompanying statement of policy, the Citizens Post-War Construction Council earnestly recommends that each community and each subdivision of government finance its own public construction projects without dependence on federal aid. This policy is advocated in all the literature of the council and in all the public addresses of its members. The wisdom of local financing in contrast to federal participation and supervision, with concomitant increase of an already staggering federal debt, is so ably presented by the council and its speakers that local communities, including both public officials and citizens, embrace the advocated policy with conviction.

Organization Meeting

Prior correspondence between E. C. L. Wagner, manager of the Associated General Contractors of Missouri, and the construction leaders of the state, both mem-

(Continued on page 136)

Buckeye CABLE control



EVEN the toughest jobs are easier with Buckeye cable controlled tractor equipment. Building roads in trackless swamps or landing strips on snowbound islands is only the proving ground for peacetime superhighway and airport construction now being planned.

With big, cool-running brakes and clutches, cable-saving fairlead action, high leverage controls, gears running in oil, ball and roller bearings, and rugged construction, Buckeye Power Control Units are doing a full wartime job every day on fronts all over the world.

Scientifically designed blade of Buckeye Cable Controlled 'Dozer digs

its way in and rolls the load ahead making possible the handling of bigger yardage. Low center of line pull keeps tractor in balance with the full length of crawlers on the ground for maximum traction. Extra high lift and exceptional digging depth provide unusual flexibility.

There is a Buckeye 'Dozer and Power Control Unit for every standard make and model of tractor, each designed specially for the tractor with which it is to be used. Keep your eye on Buckeye on wartime jobs, remember it for your peacetime jobs.

Buckeye Traction Ditcher Co.
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Convertible Shovels
Spreaders
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Tractor Equipment
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Sonotube



Concrete Pier Forms

Note Minimum
Lumber Required



Laminated
Fibre Tubing
Cut to Length on Job

IMMEDIATE DELIVERY

6 Standard Sizes

INSIDE DIAMETER					
8"	9"	10"	11 1/4"	12"	13 1/2"
SQUARE INCHES					
50.26	64	78.54	100	113.1	144

Smaller sizes available.



SONOTUBE is a tried and tested product—first used in war construction, it is now available for all. Complete information and delivered prices on request.

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ROCKINGHAM, N. C. GARWOOD, N. J. LOWELL, MASS.

(Continued from page 134)

bers and non-members of the A.G.C., had sharpened the minds of these men with respect to the need for a state-wide council to assist municipalities in completing plans for post-war improvements. When 70 of the state's outstanding citizens came together at Jefferson City on August 10, they already had a clear conception of what they wished to accomplish on that day, and the agenda drawn up by Mr. Wagner, with the advice of some of the best minds in the capital city, were designed to facilitate the accomplishment of the desired end in a one-day meeting. Roger R. Riney, at that time president of the A.G.C. of Missouri, was elected temporary chairman. In a 5-minute keynote address, he set the tone for the entire meeting by stating succinctly and forcefully that the men attending the meeting had come together to perform an unselfish service for the good of the people of Missouri and that they proposed to dedicate themselves to this task without regard to their own self-interests. Actually, as he said, they would derive benefit, along with all the other residents of the state, from a prosperous Missouri; but their guiding purpose was to see that employment was available when needed for all the citizens of the state after the war.

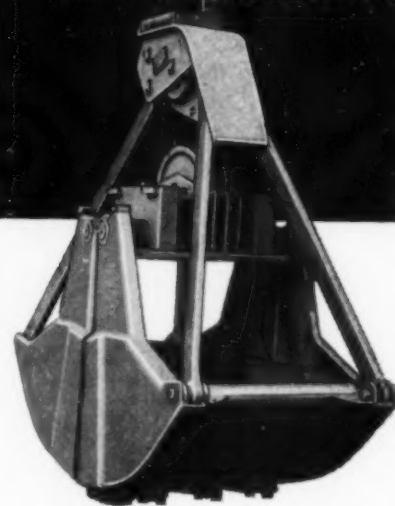
In a specific sense, the Associated General Contractors of Missouri were particularly unselfish in promoting municipal public works. The members of this A.G.C. chapter are heavy construction contractors who hardly ever enter a bid on a municipal project, as most of these jobs are too small for the members' equipment. Nevertheless, these men saw the great need of spurring local communities to complete their plans and financing for post-war municipal improvement, and the contractors are willing to contribute their time and money to see that these municipal projects are ready to be let to contract to other non-member construction firms after the war. The August 10 meeting was successful in creating a going organization, and a statement of policy was prepared by a special committee and adopted by letter ballot of the Citizens Post-War Construction Council on September 9.

Statement of Policy

Attention of the reader is called to the statement of policy printed with these notes. The policy statement covers in adequate fashion the essential needs of completing preparations now for useful projects, forming local citizens committees to assure wide representation, making a study of the laws on public works construction, cooperating with all forms

(Continued on page 138)

New JOHNSON all-Welded BUCKETS



New and exclusive Johnson features give this new streamlined bucket efficiency-promoting and life-prolonging advantages in all centers of action.

Needle
Bearings
Sealed
Against
Dirt

All-Welded
Construction
Reduces
Digging
Resistance

Its all-welded construction eliminates power-wasting bolts and rivets . . . provides greater stability through proper weight distribution.

A renewable lip edge bar, of durable manganese steel, gives greater digging efficiency and many times the life of the ordinary steel lip construction.

Renewable
Manganese
Steel Lip
Edge

Large
Diameter
Sheaves
Increase
Rope Life

Guide sheaves replace conventional cross-rollers . . . greatly reducing cable wear. Needle bearings (protected against dirt by special synthetic rubber seals) are used on all closing sheaves.

General Purpose Type (1/4 to 2 yard capacity) in stock for immediate delivery to U. S. and Canadian contractors with required Government authorization. The line also includes Rehandling Buckets 1/4 to 2 1/2 yards, Heavy Digging 1/2 to 1 1/2 yards.

Get
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Johnson Bins
— Batches —
Ready-Mix
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The C. S. Johnson
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OLIVER RIVETS

Dependable Fasteners for Structural Steel

For fast erection and tight joints, choose your rivets with care! The full economy and basic dependability of the rivet are made doubly sure when you specify OLIVER. Round, true shanks, accurate sizes, uniform materials mean faster driving, stronger joints, greater all-around satisfaction.

Oliver rivets are made by one of the largest and oldest firms in this business. Our modern equipment and methods assure uniform production of highest quality rivets in all commercial sizes and head types.

As an aid to faster erection NOW, and dependable joints ALWAYS—specify OLIVER!

Other Oliver products used by the engineering construction industry are: fitting-up and other bolts, drive and screw spikes, pole line materials, special fasteners.

OLIVER
IRON AND STEEL

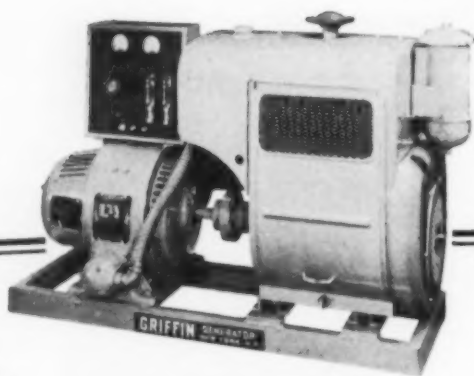
Corporation

Makers of Pole Line Materials
Since 1894

PITTSBURGH, PA.



Engineered and built to give you the same dependable long life as all GRIFFIN PRODUCTS.



Another Dependable

GRIFFIN GENERATOR

Compact, moderately priced. Sturdy construction for the construction field. Smooth operation. 120—240 volts—3-wire A.C. Light and power from the same machine.

GRIFFIN Generators are economical in operation and maintenance. Other models for lighting only. Mounted either on skids or wheels for easy portability.

Call or write any of the addresses below

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GRIFFIN ENGINEERING CORP.
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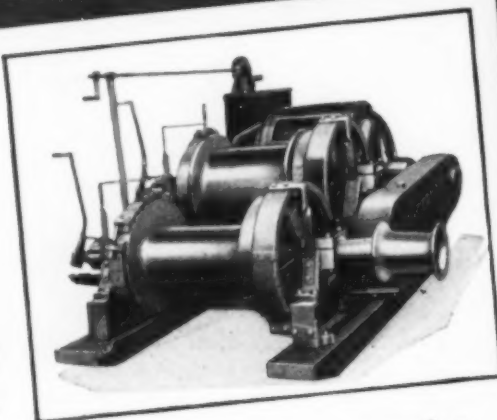
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Hoists to Fit the Job



Lidgerwood hoists have earned a 70-year reputation for dependability and efficiency on the job. There's a Lidgerwood gasoline, steam, electric or Diesel hoist to fit every construction need. When you need

a hoist inquire first of LIDGERWOOD.

HOISTS FOR:
CABLEWAYS
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MINES—DOCKS
RAILWAYS

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ESTABLISHED 1873

Manufacturing Company

MAIN OFFICE AND WORKS • ELIZABETH, NEW JERSEY

(Continued from page 136)

of private enterprise, advocating local financing of local projects without federal assistance.

Each community has its own customs and its own conditions to consider in setting up a local post-war construction committee, and the general plan of the Missouri Municipal League must correspondingly be modified to fit the circumstances. In some communities, a small committee may be preferred for more effective action by local business and civic leaders, but the basic plan of the Municipal League recommends an all-inclusive general committee embracing representatives from every civic, business, labor, church, welfare and neighborhood organization worthy of the name. A large group of this kind has the ability to sift out the most needed and most worthy public improvements and to recommend these projects to the citizens without any political implications, thus taking the pressure off the public officials, a relief for which the officials often are most grateful.

Important subcommittees are included in the organization of the local post-war construction council. The most necessary are a project research committee, a ways and means committee and a public participation committee. Their names suggest their purpose and activities.

Aids to Local Action

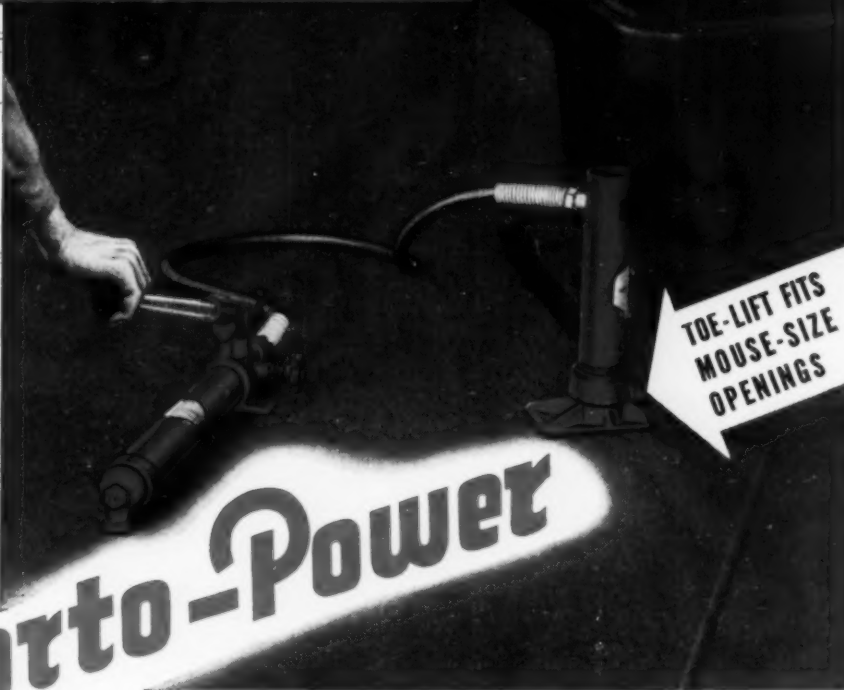
To assist local communities in starting or furthering a program of municipal post-war construction works, the state-wide Citizens Post-War Construction Council supplies speakers to appear at public meetings, offers advice gained through wide experience and furnishes literature which explains the need and the methods of setting up a local program. After a local committee has been appointed, it obtains continuing assistance at any time that such help may be desired by correspondence and telephone calls to the headquarters of the Citizens Post-War Construction Council in the capital city. In addition, the state-wide council has appointed district chairmen who are voluntarily giving a great proportion of their time to keeping in touch with the public officials and committee members of communities in their regions of the state.

Keeping Record of Progress

Among the members of the Citizens Post-War Construction Council are a number who visit Missouri communities on business or who employ traveling representatives to make such visits. In addition to taking care of their own business,

(Continued on page 140)

Don't Let **PRY-ITIS** Endanger
Your Men and Damage Machines!



TOE-LIFT FITS
MOUSE-SIZE
OPENINGS

USE **Porto-Power**
LIFT THE LOAD SAFELY and EASILY!

Like mighty fingers of a powerful hand, the Toe-Lift of Blackhawk Hydraulic Porto-Power slips into mouse-size openings and lifts the load right off the floor! No back-straining "pry-itis"! One man, *with Porto-Power*, lifts and lowers heavy, cumbersome loads easily, speedily and safely!

That's not all! Porto-Power will bend, straighten . . . pull, push . . . spread or press . . . clamp and lower. Simplify 1001 tough jobs — put irresistible precision-controlled force at just the spot where you need it! *Use Porto-Power!*

Shafts, pipe, bars and beams are straightened *cold* with Porto-Power! Banish open-

flame "*torch-itis*" that menaces men and weakens metal! Abolish "*sledge-itis*" and the scores of other "*itis*" hazards! Do the job with Porto-Power!

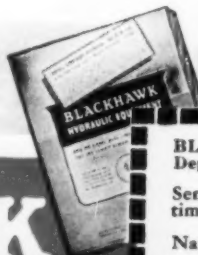
So amazingly versatile and adaptable are Porto-Power combinations that this Blackhawk product is fast becoming indispensable standard hydraulic service equipment in production plants, shipyards, construction companies and repair and service organizations.

Write Blackhawk or call your industrial supply distributor for complete information on Porto-Power in 7, 10, 20 and 50-ton capacities.

A Product of **BLACKHAWK MFG. COMPANY**
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BLACKHAWK
Hydraulic Equipment — Wrenches

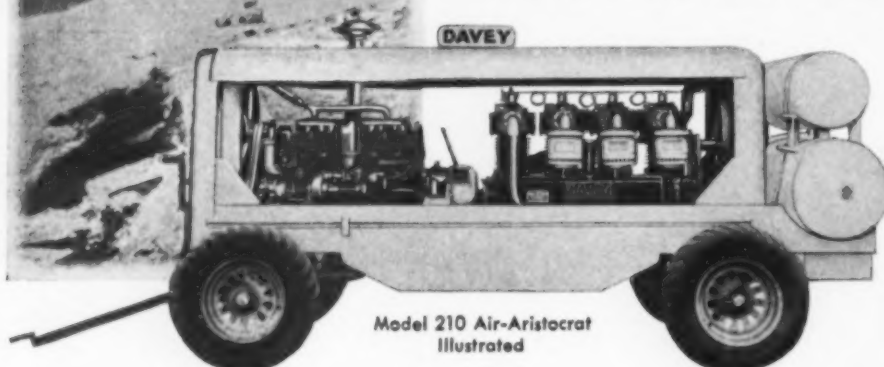


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Send catalog on Porto-Power and complete war-time Hydraulic Equipment Line.

Name _____
Firm _____
Address _____



DAVEY Air-Aristocrat COMPRESSORS



Model 210 Air-Aristocrat
Illustrated

... offer you these advantages!

✓ **AIR COOLED** — no water pumps to adjust, no jackets to drain or clean, no danger of freezing — lower service costs.

✓ **ALUMINUM-ALLOY HEADS** — again available in DAVEY compressors — allow heat dissipation three times as fast as cast iron, completely eliminating carbon formation on intake and discharge valves. No removal of heads to clean carbon, constant delivery of full air capacity.

✓ **ENGINEERED FOR TROUBLE-FREE SERVICE** — individual compressor cylinders . . . cylinders and heads separately removable . . . full force-feed lubrication . . . centralized control panel . . . heavy-duty industrial clutch (or fluid drive in Model 105-D) . . . electrically-welded chassis . . . skid- or wheel-mounted . . . available in 60, 105, 160, 210, and 315 cubic feet capacities.

DAVEY-ENGINEERED FOR RUGGEDNESS AND CONSERVATIVE SPEED

Some Distinguished Users of DAVEY Compressors

R. D. Baker Contracting Co.,
Detroit, Mich.

Barker Bros. Construction Co.,
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DAVEY
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DEALERS IN PRINCIPAL CITIES

Davey Also Manufactures a Complete Line
of Industrial Compressors, Heavy-Duty Power
Take-Offs and Pneumatic Saws.



Write today for
YOUR copy of
the new Davey
Catalog E-172

(Continued from page 138)

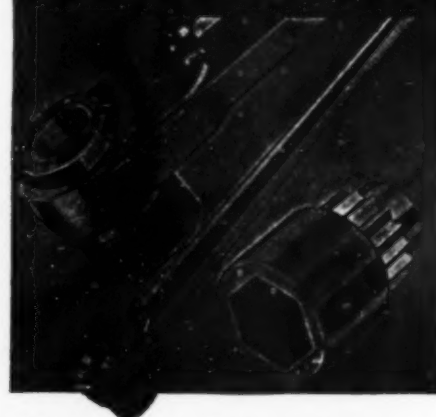
these men take the time and trouble to investigate local pre-planning for municipal post-war construction. The results of their investigations are entered on field report sheets similar to the one reproduced in these notes, and the report is mailed to the council's headquarters. Where these field reports indicate that some progress is being made, a questionnaire is sent at a later date to a responsible municipal official, usually the mayor, and to a citizen group like the chamber of commerce. The second questionnaire, headed "Report of Progress," is likewise reproduced here. The last question on the sheet should be noted: Can the Citizens Post-War Construction Council help you? Up to March 15, 24 cities and towns had asked for help.

Accomplishments to Date

Up to March 15, the Citizens Post-War Construction Council was able to report local citizens committees in 59 of the 200 communities which it was attempting to serve. Thirteen district chairmen were actively functioning at that time, maintaining close contact with the communities in the districts assigned to them. More than 35 speeches had been delivered.

(Continued on page 142)

ARMSTRONG CONSTRUCTION TOOLS



ARMSTRONG DROP FORGED CONSTRUCTION RATCHETS

The **ARMSTRONG** Reversible Ratchet Construction Wrenches are made of steel thruout—the Ratchets are drop forged, the Nut Socket machined from special analysis bar steel. All parts except the handle are hardened. The spindle of the Ratchet is of "wide open" design—permits bolt to pass thru the Ratchet so that nuts can be run any distance along bolt and securely set with one setting. 24" or 36" Ratchets take square or hexagonal sockets for nuts of from 1" to 2 1/2" dia. or 1 1/2" to 3 1/2" dia., respectively.

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"The Tool Holder People"
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Exclusive Warehouse & Sales, 199 Lafayette St., New York

Dependable Globe-Trotter

OSGOOD
SHOVELS and CRANES
Go Where the Fighting and Digging
are **TOUGHEST**



Headed for the fighting front are another 48 tons of cargo that will "dig down" and pay its own passage anywhere.

In Italy, on New Guinea and Guadalcanal, from Alaska to South America . . . in every part of the globe where our combat forces need roads and construction, Osgood Shovels and Cranes are helping to clear the way to Victory.

Rugged, dependable, easy to handle and maneuver because of Osgood measured air control, these shovels, pile drivers, drag lines and cranes are do-

ing outstanding work in *all* kinds of going . . . from rubble to rock.

Soon, thanks in part to their performance in this country and abroad, Osgoods again will be available to the construction field. Until that day, keep your dependable Osgood in action with preventive maintenance!

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"PREFERRED THE WORLD OVER"

Power, portability, simplicity and built-in dependability distinguish all Master Vibrator Company equipment . . . make it the choice of thousands of engineers and contractors wherever work must be done fast, efficiently and at lowest operating and manpower cost. Immediate delivery.
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SHOCK BAND

Steel re-enforcement which substantially increases handle strength. (Solid Shank and Socket Shank Types)

The features embodied in "Ames" shovels are important to the Seller of these pioneer shovels, because they are the "selling points". They are of equal importance to the Buyer, because they give to these famous shovels, greater strength, longer wear and a finer appearance. Also important to remember . . . every feature originated and developed by "Ames"!

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Blade Taper Rolled—produces greater strength and toughness. (Taper Rolled Type)

AMES BALDWIN WYOMING CO.
PARKERSBURG, W. VA. NORTH EASTON, MASS.
Shovels . . Spades . . Scoops . . Forks . . Hoes . . Rakes

(Continued from page 140)

ered by representatives of the council before public meetings, including local meetings of city councils, chambers of commerce and service clubs, and conventions of county judges, municipal leagues, water and sewerage operators and lumbermen's associations. The most active and eloquent speakers spreading the message of the council's program up to that date were F. T. (Tip) Brown, Kansas City, chairman of the Citizens Post-War Construction Council, and E. C. L. Wagner, Jefferson City, secretary-treasurer. Martin E. Lewis, Jefferson City, was another able exponent of the council's program before public meetings. Bruce J. Carl, executive director, Missouri Municipal League, is a vice chairman of the council.

With respect to the critical end-product of all these efforts: actual blueprints, land and money for post-war projects, the volume in the locker on March 15 was too small to be worth reporting. The ground had been broken, but the hard work of plowing, planting and cultivating the soil remained to be done. It is this work which requires the full-time services of five or six capable representatives to cover the state and provide the personal aid and advice necessary to stimulate local action. The Citizens Post-War Construction Council intends to see that such a staff is put to work soon. Members of the Council are acutely conscious of the fact that time rapidly is passing and that not many months remain in which to complete all preparations for post-war construction.

★ ★ ★

Pumped Concrete

(Continued from page 74)

operation. The concrete is initially mixed with approximately 4 gal. of water per bag of cement. Spinning the pipe forms reduces the water to approximately 2½ gal. per bag. The removal of this excess water, together with the compaction developed by centrifugal force, produces a concrete with compressive strengths of 12,000 to 15,000 lb. per sq. in. and a density of 159-161 lb. per cu. ft.

The mixing plant and arrangement for pumping the concrete shells includes batch hoppers under a two-compartment 50-ton aggregate bin discharging on to a

(Continued on page 144)

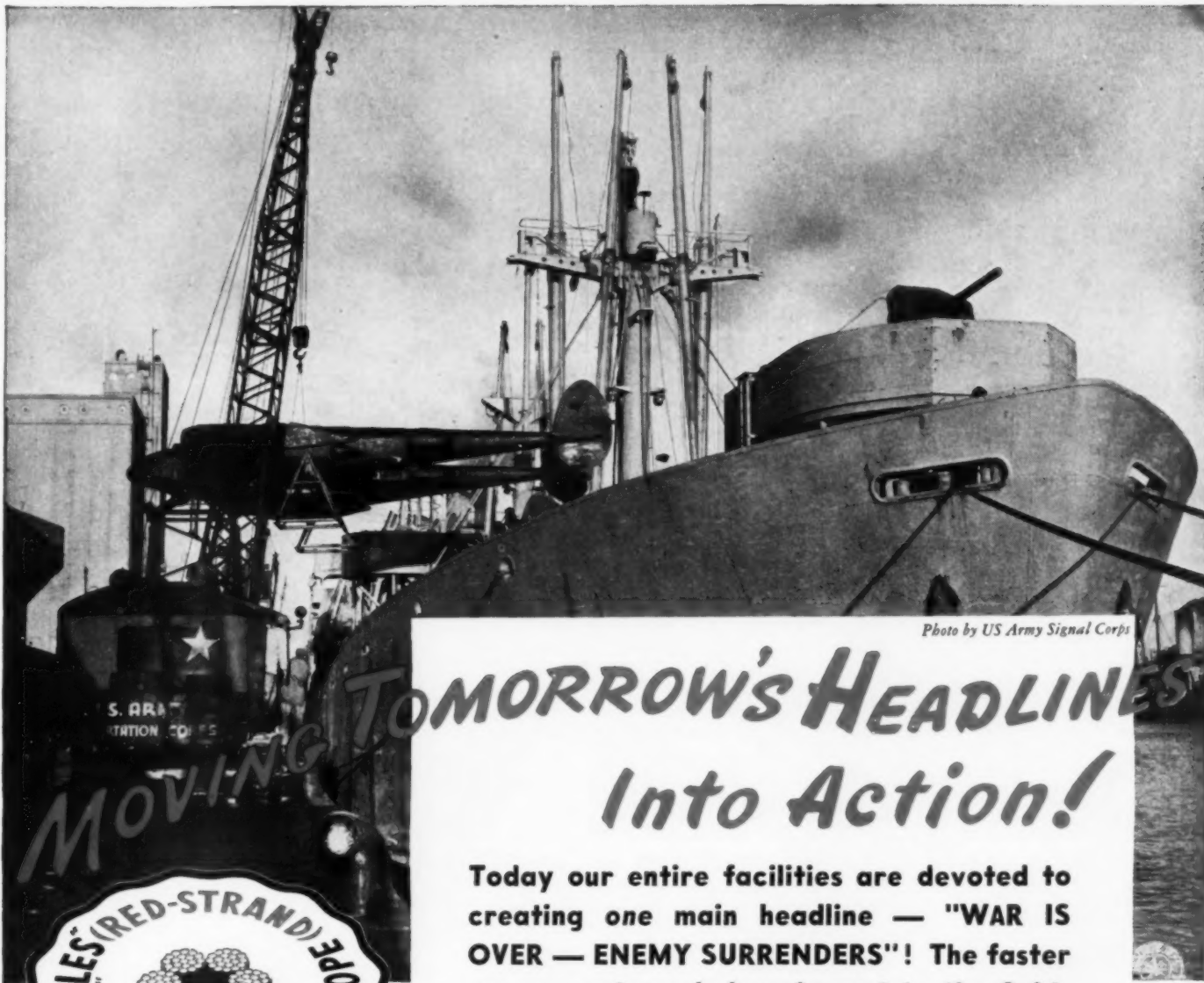


Photo by US Army Signal Corps

MOVING TOMORROW'S HEADLINES Into Action!

Today our entire facilities are devoted to creating one main headline — "WAR IS OVER — ENEMY SURRENDERS"! The faster we can get needed equipment to the fighting areas, the sooner that headline will appear.

After that — there will be many more tomorrows when "HERCULES" (Red-Strand) Wire Rope will again play its leading part in peace-time production and pursuits. For long service and economical performance include it in your post-war planning.

Meanwhile . . . Your wire rope will last longer if given proper care.

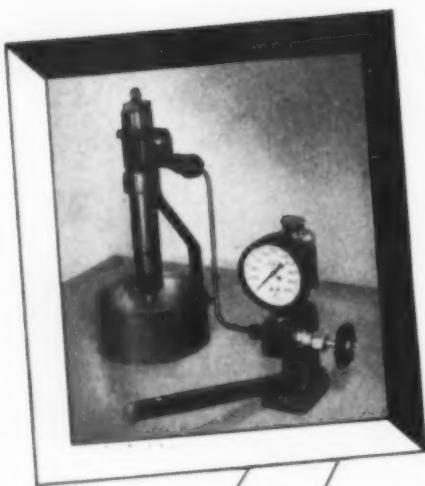


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Write for new
illustrated
bulletin.



(Continued from page 142)

short vibrating screen and belt conveyor which riddles off the oversize aggregates and foreign materials and relays the batch into the skip of a 21E paving mixer where bag cement is added. The mixer discharges into a 1 1/4-cu. yd. remixing hopper of a 160 single Rex Pumpcrete mounted on a self-propelled carriage with 25-ft. travel between mixer and forms, this distance being required to provide clearance between the end of the withdrawn discharge pipes and the spinning machine for the handling of the 12-ft. pipe forms. When the sidewall thickness of the shell is greater than 2 in., concrete is placed in two operations to avoid segregation of the materials and to facilitate the removal of all excess water.

Forms

All pipe sizes are cast in 12-ft. lengths. The steel forms are fabricated in two sections, bolted together for convenient assembly. Cast-steel end-rings, which serve as rolling tracks, are held fast to the steel forms by longitudinal rods running the full length of the form and threaded on both ends. These rods, spaced approximately 6 in. on centers and set 1 in. inside the steel form, are tightened by wrench until each rod is under a stress of 30,000 lb. per sq. in. They are incorporated in the concrete when the shell is spun to provide the longitudinal prestressing. When the nuts are removed, the tension in the rods is held by the bond of concrete, developing a longitudinal compression of 90 lb. per sq. in.

The rolls of the spinning machine are adjustable for width to accommodate the various size forms which ride at an approximate angle of 45 deg., from center of form to center of rolls. It is essential that the cast-steel end-rings be accurately machined and the forms in almost perfect balance or they will jump the rolls when revolving at high speed.

Spinning and Pumping

At the start of a pour, two sets of forms are lifted by chain hoists from the end of the form-assembly line and placed in position on the spinning machine. The loaded Pumpcrete is rolled forward until the ends of the twin delivery pipes are about 1 ft. from the end of the forms. The spinning machine is started at 90 rpm. Concrete is deposited in equal proportions in each form as the Pumpcrete carriage is slowly withdrawn. Depending on the size of pipe, from 2 to 4 min. are required to place one-half of the concrete in each form. Then the speed of the spinning machine is stepped up to 250 rpm. for 5 min. In this short period centrifugal force packs the concrete against the forms, driving all excess water to the inner surface.

Meanwhile, the Pumpcrete has been

(Continued on page 146)

NATIONAL GUNITE PRESSURE- PACKED CONCRETE has superior advantages:



Low water ratio assures density at all points — no voids, no bubbles or air pockets . . .

Waterproof — perfect steel protection . . . Greater strength with less thickness . . . No waste of material . . . Great savings in time.

Recommended for rebuilding or relining disintegrated concrete as well as new work. National Gunitite is a coast-to-coast engineering organization with years of experience, supplemented by field crews of skilled Gunitite operators.

Write giving your requirements.

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SUPERIOR QUALITY GRADER BLADES

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GIVE LONG
EFFICIENT SERVICE
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Made for all types Motor Graders, Maintainers, Scrapers, Drags, Bulldozers, Backfillers, Wagon Scrapers, Trail Builders, Trail Blazers, Carryalls, Snow Plows, Etc.

Mill rolled from our special analysis high carbon, high manganese plow steel—

Forged edges and ends add strength and fineness. Prompt shipment assured from an ample stock. Give name, model number, length and thickness, also total number of holes in blade. Write for bulletin.

**Shunk
Mfg. Company**
Established in 1854
BUCYRUS • OHIO



Exhibit A... **OF A VITAL POSTWAR JOB, EVERY COUNTY, U. S. A.**



Cleaver-Brooks Portable Tank Car Heater—a high pressure, oil-fired, compact mobile heater, available in two and three tank car sizes.

Truck-mounted Cleaver-Brooks Portable Pumping Booster used in airport, flight strip, and road construction.



THE above picture could be that of any one of scores of American highways. Temporary patching and spot repairs may serve for the duration, but War's end will call for a nation-wide program of existing road reconstruction plus new highway projects.

Be ready—be competitively equipped—to get your full share of the work.

Time and cost-saving machines will enable you to handle more jobs with more profit . . . Write today for complete information on Cleaver-Brooks Tank Car Heaters and Bituminous Boosters. Get the complete facts on their high speed low cost performance—heating road oils and bituminous materials to application temperatures. Learn why the original and exclusive Cleaver-Brooks four pass down-draft flue travel and integral burner construction, plus the positive dry-coil method of condensate return, provides unsurpassed speed and economy. Cleaver-Brooks Tank Car Heaters are built in two and three tank car sizes—Portable Pumping Boosters in two capacity sizes, with truck mounting or 4-wheel trailer. Send for bulletins or see your Cleaver-Brooks distributor.

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TANK CAR HEATERS . . . BITUMINOUS BOOSTERS . . . AUTOMATIC STEAM PLANTS

For SPEED and SAFETY . . .



LOWELL Reversible Ratchet WRENCHES



You gain speed through the easy handling, strong leverage and straight-line application of power on LOWELL REVERSIBLE RATCHET WRENCHES.

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Have patience with your dealer if he is unable to furnish all of the numerous LOWELL types and sizes, for we are engaged, for the duration, in supplying the needs of our Armed Forces.

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WORCESTER, MASS., U.S.A.

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See how each pawl, when engaged, transmits leverage from the solid stock of the handle, direct to the gear, in a straight line and with a "square" contact. The pawl is in COMPRESSION ONLY—no shear, no tension, no torsion. The shipper carries NONE of the load. This strong construction insures steady service.

MIRROR-FINISH CYLINDER HONING



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No "hidden detail" of design and construction is neglected or sacrificed to "price expediency" in the manufacture of these fine engines. These details are important to YOU in the operation of your equipment. Wisconsin air-cooled engine power is the answer.

Most
H.P. per
pound



WISCONSIN MOTOR

Corporation

MILWAUKEE 14, WISCONSIN, U. S. A.

World's Largest Builders of Heavy-Duty Air-Cooled Engines

(Continued from page 144)

rolled back to the mixer for a fresh batch of concrete and is ready for the second and final pass, after the spinning machine has been stopped and water broomed out of the form. When the second layer of concrete has been deposited and the spinning machine again has been stepped up to full speed for another 5-min. run, a man at each end of the forms holds a bar tool designed for the purpose against the inner edge of the revolving form-head to draw the I.D. of the pipe to exact size. A high degree of accuracy is obtained in this manner, as centrifugal force makes the material seek a uniform thickness inside the form. Excess water is removed in the final operation by sliding a bar in and along the pipe invert.

When the final spinning operation has been completed, all of the excess water has been removed and the concrete presents a hard polished surface. After the pipe has been carefully inspected, the completed sections are removed by another set of chain-hoists at the far end of the spinning machine and rolled on to a steam-curing rack. After 24 hr. of steam-curing the forms are removed from the concrete shells, cleaned and reassembled.

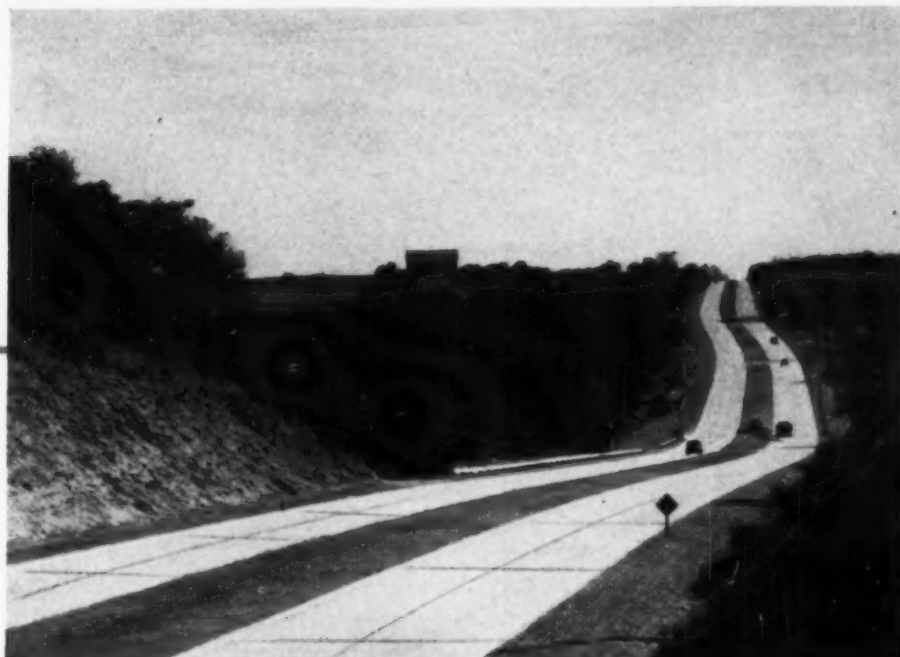
One of the features of the pumping operation is the high degree of accuracy obtained in depositing the exact amount of concrete required to fill the various size forms, thus holding waste to a minimum. The consistency of the concrete can be held close enough to assure a uniform rate of production through the pump. After a short experimental period the traveling speed of the pump carriage was readily synchronized with pumping speed to distribute the correct volume of concrete for each set of forms.

It was also quickly discovered that it is necessary to clean thoroughly both of the twin 5-in. discharge pipes from the pump after the completion of each day's operation to assure an equal distribution of concrete into each of the two forms. As long as these discharge pipes are spotless at the start of the day's run they will deliver an equal flow of concrete. If one pipe is fouled with patches of concrete residue from a previous run, it will lag behind the production of the other.

Pumpcrete Economy

Use of the Pumpcrete for this work has resulted in a 50-percent labor saving and doubled the output of the plant as operated by hand-placing methods. In other words, one-half as many men can turn out twice the previous daily volume of pipe with the one spinning machine setup. Formerly an 8-man crew was required to maintain an average of 2 pipe lengths per hr. By use of the Pumpcrete setup

(Continued on page 148)



Ohio State Route 18 near Medina.
Constructed by AGC Contractor A. J. Baltes.

"BETTER ROADS FOR A BETTER WORLD"

America's vast highway system has been a vital factor in economic and social developments. The gauntlet from ox-cart trails to elevated express highways has been successfully traversed in little more than 100 years.

Today, American engineering and high speed highway and airport construction methods are playing a vital part in winning the war on all fronts.

American methods will not be set aside when the war is won. All nations have post-war highway plans predicated on the American way. When these plans go into operation, this will be a "Better World" because of "Better Roads".

Heltzel Engineers have kept pace with the ever-changing requirements in concrete construction. Catalogs for all types of concrete highway and airport construction equipment are available. Write today for your copies.



Road Forms . . . Airport Forms . . .
Batching Plants . . . Bulk Cement Plants
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Concrete Buckets . . . Finishing Tools

HELTZEL Steel Form & Iron Company • Warren, Ohio, U. S. A.

Manganese Steel Dredge Pumps In T.V.A. Wartime Projects

Tennessee Valley Authority's dual war assignment has been to supply additional electric power and to increase aluminum output from its territory.

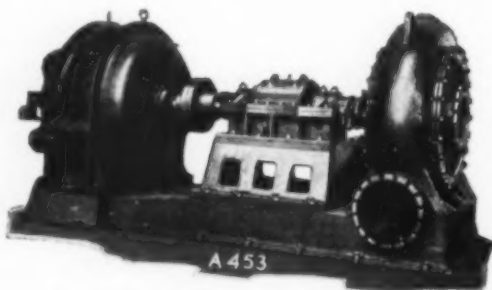
New dams were rushed to completion to provide deep lakes of impounded water; literally reservoirs of power. For the Appalachia and Ocoee dams, the Birmingham Slag Company of Birmingham, Ala., was the principal supplier of concrete aggregates, a large proportion of which was sand and gravel from the bed of the Tennessee River.

They had two hydraulic dredges on this project. One unit was primarily assigned to excavation, with the other as a standby machine to assure uninterrupted production when repairs were required. Both dredges are equipped with rotary cutter ladders for 50-ft. digging, and 15-in. Amsco type H Form 44 heavy duty dredge

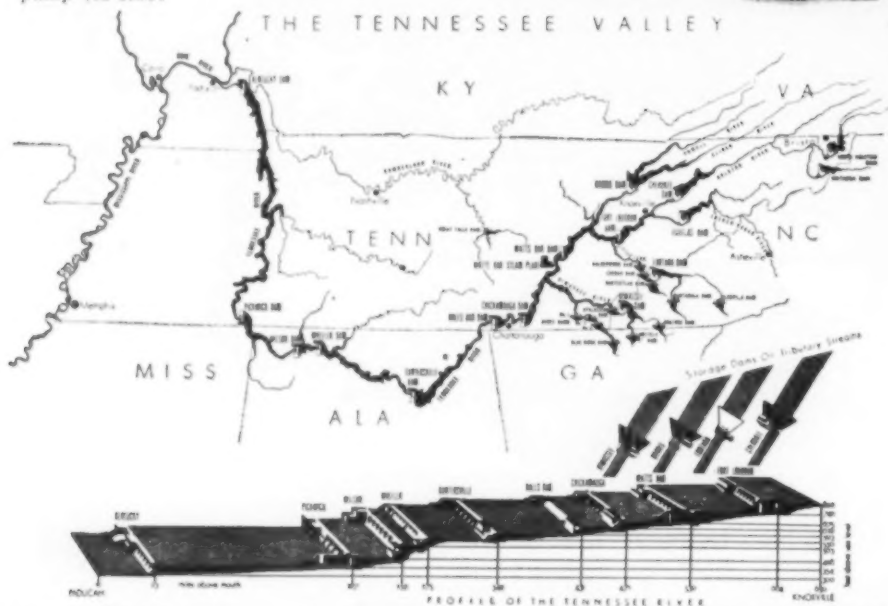
pumps, powered by 400 h.p. 440 r.p.m. electric motors. All materials were pumped direct to barges which were towed to the screening plant docks. An Amsco pump similar to those employed is pictured (A453).

The company has fulfilled every demand for aggregates on continuous 24-hour operations. The large volume of sharp aggregates handled under high velocity and pressure required dependable pump parts of long wearing life. Impact and abrasion resistant manganese steel, in Amsco water-end castings, played an important role in T.V.A.'s great war task.

Ask for bulletin on Amsco Dredge Pumps, Pipe Fittings and Rotary Cutters.



Amsco 15-in. type "H" heavy duty sand and gravel dredge pump (A-453).



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AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Illinois

FOUNDRIES AT CHICAGO HEIGHTS, ILL.; NEW CASTLE, DEL.; DENVER, COLO.; OAKLAND, CALIF.; LOS ANGELES, CALIF.; ST. LOUIS, MO.
OFFICES IN PRINCIPAL CITIES

AMERICAN
Brake Shoe
COMPANY

(Continued from page 146)

the average has been boosted to 4 pipe lengths per hr. with a 4-man crew who batch the aggregates, dump the cement, operate the mixer, Pumpcrete and spinning machine and handle the pipe forms.

The reason for the labor reduction is more or less self-evident. The time element is affected because the concrete is pumped into the forms faster than it can be shoveled by hand and the spinning period is reduced approximately 50 percent (from 10 to 5 min.) because the pump handles a much stiffer mix and distributes it more evenly. The initial water content of the mixed concrete has been reduced from 5 gal. to 4 gal. per sack of cement. As previously stated, the spinning process ultimately reduces the water content of the fresh concrete in the finished pipe to approximately 2½ gal. per sack of cement, so that 40 percent of the excess water is eliminated at the start by use of the Pumpcrete.

At the present time one spinning machine is adequate to service the requirements of this plant, but it is estimated that with the addition of two or three men to the gang, the Pumpcrete could just about keep three sets of rolls going, thus greatly increasing production at anytime an appreciably larger output is desirable.



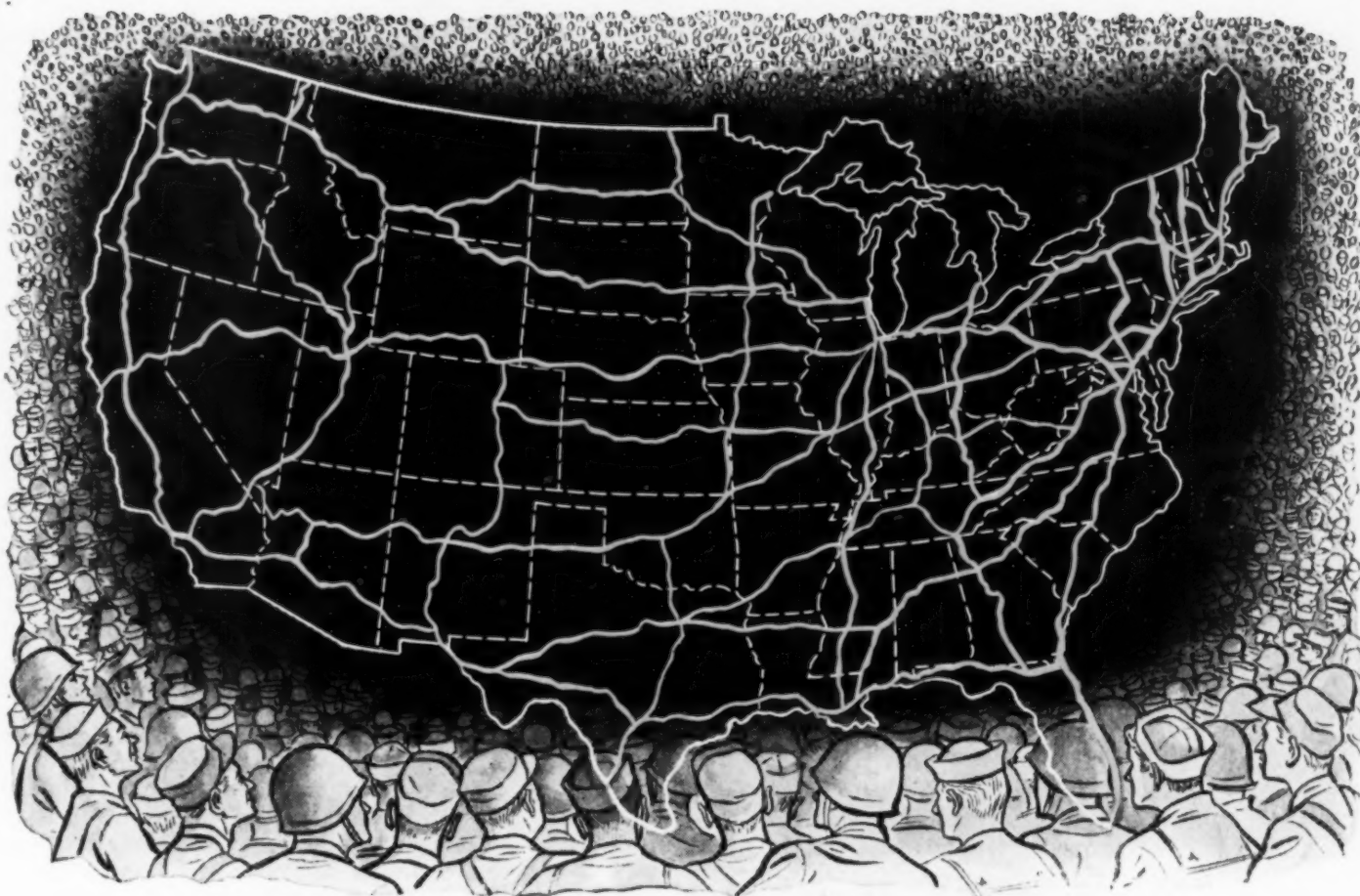
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If you are looking for a way to expedite reconditioning, repainting or overhaul of such roadbuilding or construction equipment as tractors, mixers, air compressors, etc., first clean with rapid-acting time-saving Oakite materials and methods.

Specially designed for this work, these materials easily, quickly remove oil, grease and muck . . . facilitate subsequent overhaul and repair. FREE 24-page manual contains helpful maintenance data. Write TODAY!

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Specialized **CLEANING**



PLANNED POSTWAR HIGHWAY PROGRAM MEANS Quick Employment For 3 Million

No one wants another depression 13,000,000 people deep. It will be much better to measure the height of national prosperity by the number of people employed.

Since it is generally agreed that gainful employment is the No. 1 factor in the national economy, it is to every American's best interest to get behind and push forward every sound postwar plan. *One such is that of the American Road Builders' Association.*

It is sound because it will quickly and directly employ 3,000,000 people on a planned highway building program sorely needed before the war and absolutely necessary postwar.

It is sound because it eliminates attempts to fill depressions with improvised work relief amply demonstrated to be slow, costly, inefficient, and demoralizing.

It is sound because it is based upon plans and specifications carefully prepared in advance, cost estimates made in advance by public engineers, bids made by competing contractors who are willing to back up their judgment with their own funds, and the requirement

of ample bond to further guarantee the delivery of quality work at contract costs and on time.

It is sound because it makes more efficient use of on-site employment and affords far more off-site employment in the production of materials and equipment. Thus, in addition to stimulating the consumer goods market, it induces far reaching employment throughout the production, transportation, and service industries. Studies made by the U. S. Public Roads Administration indicate that the proposed investment of 3 billion dollars annually in highways eventually results in business transactions totaling 9½ billion dollars.

Every American who wants to get early enjoyment of a better planned highway system, constructed better at the lowest bid cost, should write for and read the 64-page book entitled "A Sound Plan For Postwar Roads and Jobs." Among other things it points out that nearly enough in motor vehicle taxes is normally collected to pay for this sound, planned program if used for the purpose intended.



WRITE FOR THIS FREE BOOK!!!

E-44

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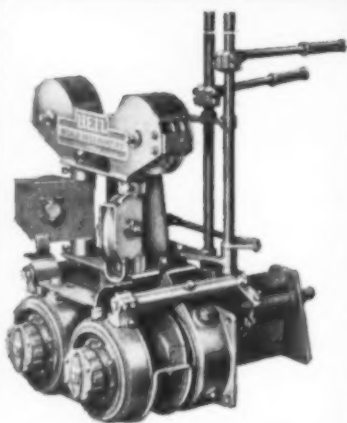
OR

UNION WIRE ROPE CORPORATION, 2160 Manchester Ave., Kansas City 3, Missouri

AS YOU BACK THE ATTACK GUARD AGAINST A FUTURE SLACK



When plenty of
Down Pressure
is required...



Dependable Power Control Units for All Makes of Tractors

Smooth-operating brake and clutch assemblies eliminate shocks and jerks; the large drums run cool; the sheaves are designed to reduce wear on cables. Fingertip control gives lightning-fast response for bigger yardage. They're designed for use with cable scrapers or other cable-operated equipment on all makes of tractors.

Write for bulletins.

Heil Bulldozers handle the toughest assignments with ease

Heil's fabricating experts have designed this hydraulic bulldozer to give you effective down pressure in hard pan, frozen ground, or rock-imbedded earth. Here is combined simplicity of design and rugged construction to assure outstanding performance.

This widely-used Heil Bulldozer is designed to work integrally with Cletrac tractors with no unusual or severe twists or strains on the tractor at any point. Balanced loads, backed by full length crawler drive, result in effective digging and dirt-moving performance, plus big savings in maintenance cost on both blade equipment and tractor. Enjoy maximum work and satisfaction with a Heil Bulldozer . . . designed and engineered to move "pay dirt" quickly, easily and economically.

R-28

SEE YOUR CLETRAC
TRACTOR DISTRIBUTOR



THE HEIL CO.

GENERAL OFFICES

MILWAUKEE 1, WISCONSIN

Electric Hoist Drive

(Continued from page 75)

for roustabout work, but their principal duty is the pouring of concrete.

During one period of the construction schedule at the dam one of these cranes picks up a 26,000-lb. bucket of freshly mixed concrete from a railroad car running between the legs of the crane tower, hoists it sufficiently to clear the side rails, racks it out to the required distance, and lowers it at 350 f.p.m. to the upper surface of the "block" being poured. After it has been dumped, the 10,500-lb. bucket is hoisted at 670 f.p.m. and landed on the car. When the dam reaches nearly its maximum height, the loaded bucket will be lifted from the car a maximum of about 50 ft., and after racking out, dumping, and racking in, it will be lowered to the car.

The drive system described according to Mr. Whiting, is not to be considered as preferable or even applicable for all types of hoists, but is intended for use in those types in which, although substantially different as to design and use, the various combinations of speeds and loads are similar.

★ ★ ★

Ship Model Shop

(Continued from page 68)

and supervisors. Here they have an opportunity to inspect and study the models.

In the display-conference room are models of every large pre-hull assembly in production within the yard, carefully cataloged and displayed. Men assigned to tackle an intricate engineering problem involving the construction or movement of large sections, meet in this room and work out their solution with scale models of the huge masses of steel. To assist riggers in determining arrangements of tackle and the proper lift methods on each assembly, a model gantry crane has been built by the shop to perfect scale. Thus, instead of discussing problems from blueprints, rigging superintendents are able visually to study the lift of each assembly, and when a decision is reached, they can instruct their crews by actual illustration.

In charge of the model shop is Edward A. Owens, former chief model maker in the Camouflage Section of the Corps of Engineers, U. S. Army, in San Francisco. A graduate of the California School of Fine Arts, Owens has been making mod-

els, miniatures, and dioramas for many years. A majority of his assistants have had either art training or drafting experience.

★ ★ ★

Leda Road

(Continued from page 60)

built to carry one-way traffic are being widened to two lanes. Along the entire route of the road, American Army Engineers can be seen building new spans to supplement the narrow bridges which were put in last year. Blind corners which twist around cliff sides are being widened to reduce chances of accident. Bottlenecks are being filled out and eliminated, so that there will be no trouble maintaining two-way traffic.

Monsoons Damage Road

The approach of the new monsoon season is one of the immediate problems facing the crews which are assigned to the job of road maintenance. Nobody can describe India's monsoons. Nobody has any conception of the monsoon season until he has been through one. Incessant rains are really incessant cloudbursts. When the rains stop for a few short hours it is only for the clouds to gather new supplies of water which they soon unleash with renewed fury. Road maintenance crews must keep the surface in shape despite this downpour, and it is not an easy task.

Worst sight to Engineers during the monsoons are ruts which get deeper and deeper as each heavily laden truck pounds over the road. Some spots are softer than others. Either the ground underneath the rock foundation is particularly soft or the drainage does not work as well as it might. It is these spots that provide the danger points for traffic during the monsoons. And it is these spots upon which additional attention is concentrated during the dry seasons so that the coming of the rains will not create the problem of bogged-down trucks at soft points, necessitating the winching of all vehicles through the area. Rock is constantly applied to these soft spots, and crews watch them carefully throughout the year, doing any repair and maintenance work which is necessary.

Further danger during the monsoon
(Continued on page 152)

The blade with its "job-designed" curve, moves through the cut smoothly... quickly... uniformly.

Plow bolts are easily removed to replace or reverse blade.

You get more drive... more penetrating power at the blade—with HEIL

Cable Dozers

Move more "pay dirt" with each load — quickly — economically

Doing a clean-cut job — cutting at just the depth desired — cutting accurately and smoothly with no washboard or gouged grade — these are features of Heil Cable-Dozer performance. End-tilt adjustments are easily and quickly made — angling the blade merely involves the removal of a pin in the side member, adjusting blade, and replacement of pin.

Heil Cable Dozers are engineered throughout for "tops" in performance and "savings" in your pocketbook. You're money ahead when you specify Heil Cable Dozers.

R-27

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In improving scraper performance, Heil engineers developed fundamental design changes, such as scientifically located draft pivot point—tilting floor push-out—contoured bowl design—all-welded box sections — etc. These improvements add up to bigger yardage at lower cost—and earn a reputation for "on-time" performance. Write for bulletins.

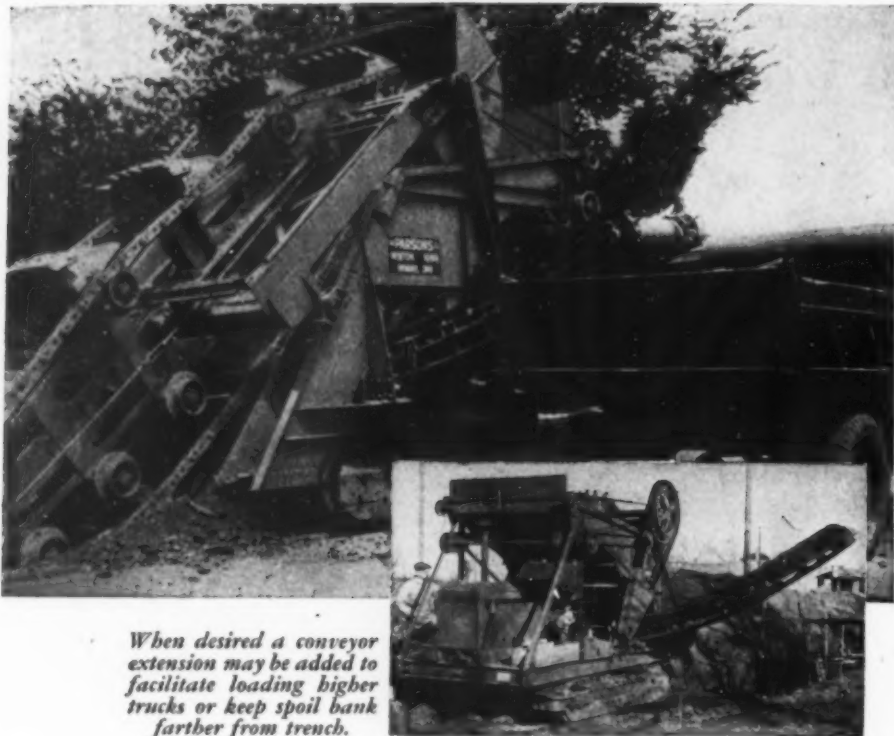


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PARSONS



When desired a conveyor extension may be added to facilitate loading higher trucks or keep spoil bank farther from trench.

QUICK SHIFT CONVEYOR

The arc type discharge conveyor on a Parsons Trencher shifts through the machine by power so that spoil may be deposited on either side of trench as desired by the operator. This shift may be made in less than fifteen (15) seconds so that an obstruction can be cleared while machine is digging—a most important feature when operating in close quarters. The shift is by worm and worm gear which automatically locks conveyor in any position.

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The spoil to be retained for back-fill is piled on opposite side of trench by merely moving a lever to reverse the direction of belt. Investigate Parsons superiority before you buy.

THE PARSONS COMPANY
NEWTON, IOWA

TRENCHING EQUIPMENT



(Continued from page 151)

season is the possibility of landslides. During the rains the ground becomes heavy with water and there is the constant fear that slides will come down on the part of the road which winds through the hills. Hillsides have been strengthened and cut away, thereby lessening the possibility of slides. Log revetments have been built, shoring up the earth so that it can remain firm despite the added weight of the water that it has absorbed.

It's no easy job keeping a road open and traffic rolling during the monsoons, but the Army Engineers along the Ledo Road are confident that this year it will be kept open all the way, despite the torrential rains which pour down over the entire stretch of the road.

★ ★ ★

Alaska Highway Bridge

(Continued from page 64)

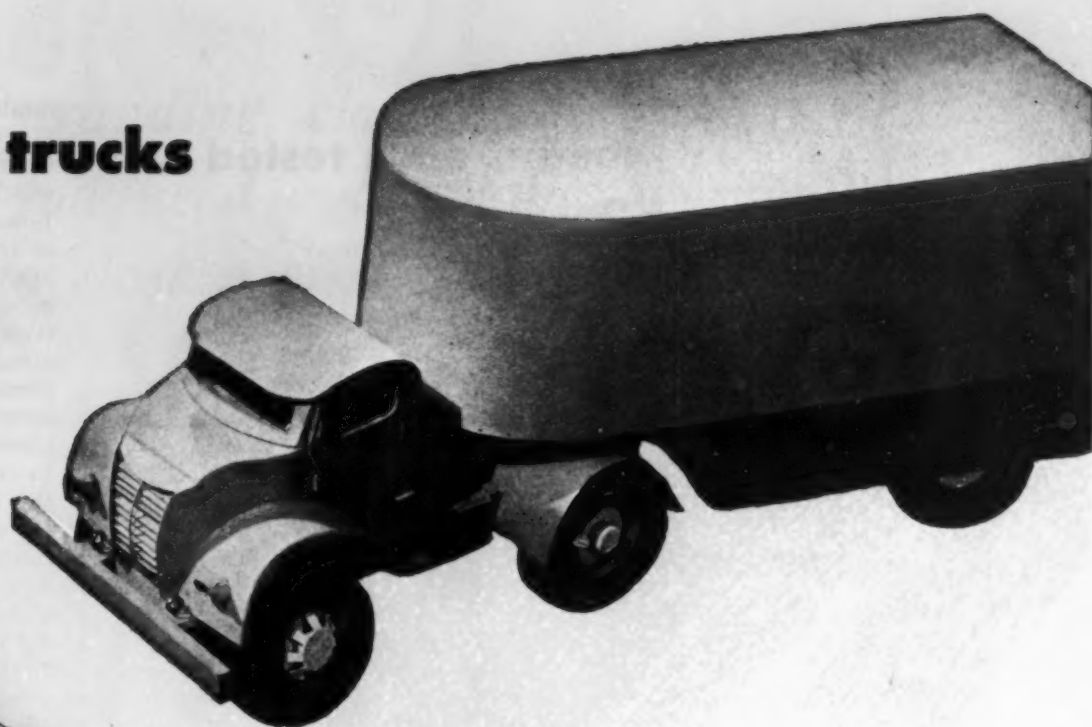
at the north end. Construction of a "tote" road to the bridge site began on Aug. 1 and was completed on Aug. 15. Two weeks later the contractor started erecting a cement shed and aggregate bins for the concrete and cutting timber for a temporary bridge across the river. By Sept. 20 this preliminary work was completed and the temporary bridge erected. Log cribs for bases to support falsework for the 190-ft. span were started. Large sandstone blocks that had fallen into the river from the ledge above were drilled and shot and used to fill the log cribs.

During the early part of October the contractor's forces completed the excavation for piers to carry the two main towers, raised the log cribs to the height of the abutments, prefabricated the forms for the tower piers and erected a wash rack for cleaning sand and stone for concrete. Arrangements were made shortly thereafter to haul sand and gravel from a screening plant at Peace River. Specifications called for class B concrete with a maximum size of aggregate of 2½ in. The coarse aggregate was furnished in two sizes, from 2½ in. to ¾ in. and from ¾ to ⅜ in., which were combined in the proper proportions.

Pouring of concrete for piers and ped-

(Continued on page 154)

A "LAZY" oil can trap your trucks



... hard-working **TALPEX**
keeps equipment on the "GO"

YOU'RE having trouble enough these days keeping your equipment on the move. Then why add to your woes by using a "lazy" oil . . . one that does only part of the job it should? Give your engines a break. Use Shell Talpex.

Many operators who have switched to this hard-working oil find their engines running for longer periods of time between overhauls, and with greater operating efficiency. The reason is simple. A "lazy" oil has only one or perhaps two of the properties necessary to efficient wartime engine operation. Shell Talpex has *all* of the necessary properties.

NEW SHELL TALPEX

IS NON-CORROSIVE to alloy bearings. Protects all lubricated engine parts against corrosion.

HAS EXCEPTIONAL OXIDATION STABILITY. Holds to a minimum the formation of sludge, lacquer and other deterioration particles.

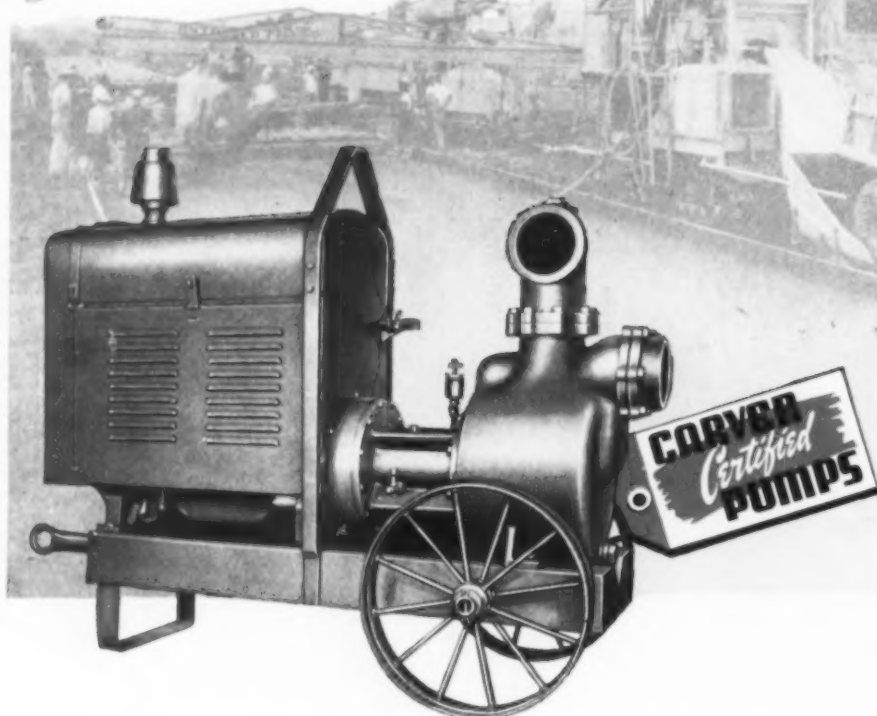
HAS HIGH DETERGENCY. Helps keep carbon, lacquer and foreign particles from adhering to pistons and rings, valves, ports.

HAS LOW CARBON FORMING TENDENCY. Reduces ring sticking and wear. Lengthens engine life.

If the oil you now use doesn't have *all* these properties, it's "lazy" . . . should be changed to hard-working Shell Talpex. Ask the Shell man to show you why.



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THE CARVER PUMP CO.
MUSCATINE, IOWA



(Continued from page 152)

estals was done between Oct. 22 and Dec. 11, with some delays caused by cold weather, breakdowns, labor shortage and waiting for completion of excavation. A 1-in. pipe was placed along the bottoms of aggregate storage bins for steam heating. A water tank was located near the mixer at sufficient elevation for gravity feed and was equipped with pipe coils to circulate steam for heating. One-inch perforated pipe was placed outside the forms at the ground to discharge steam. Canvas covers were placed as necessary to confine the heat and moisture during the 10-day curing period. A thermometer was placed in the form and read each morning. Steam for heating aggregates and water and curing concrete was supplied from the boiler of a 50-hp. threshing engine. Cold weather was the greatest obstacle on this part of the work. At times it was almost impossible to wash the aggregate, and much difficulty was experienced in preventing freezing in the excavations for footings.

Early in December a large crew was set to work cutting timber for falsework bents. On completion of the concreting, the entire crew was placed on erection of falsework. Falsework for the 190-ft. span rested on four rock-filled log cribs 30 ft. wide and 20 ft. long, placed in the river and spaced to give a 20-ft. clear opening. Sills were set adjacent to the concrete piers to support bents so that the tower timbers could be placed in exact position for their full height. At each end of each of the cribs in the river a bent was erected for a height of 30 ft. These bents were 30 ft. wide at the bottom sill and the outside posts battered inwards 1 1/4 in. per ft. of height. After these bents were cross-braced, a deck of round logs was placed on the caps.

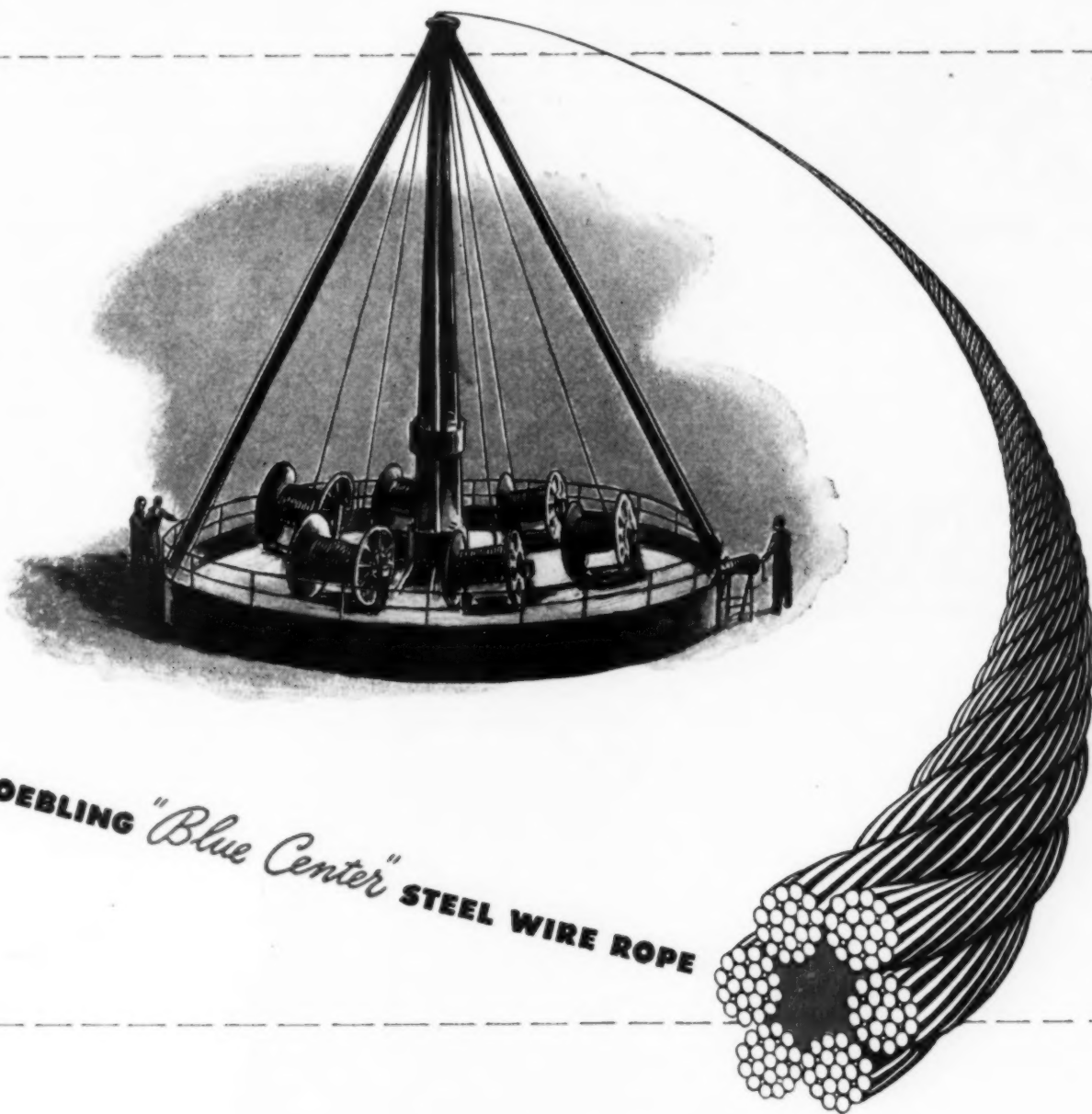
The second lift of bents varied in height to allow for a 1-percent rise from the south to the north end of the bridge. This lift was approximately 18 ft. in height and a working deck was placed upon it. A rigid-frame traveler was constructed of logs for placing the top chord members and diagonals in position. It was supported on log sills which ran between log guides and was large enough to clear the trusses. Falsework for the 114-ft. spans was of similar construction, except that the bents rested on sills set along the hillside.

Timber Superstructure Erected

From Dec. 11 to Jan. 30 the contractor's forces erected falsework, stripped the concrete forms, backfilled around piers and pedestals, and erected a material shed at the south bridge approach. During this period some of the men were sent to

(Continued on page 156)

Rope making, stranding, closing equipment fitted to the job. If you need a 5" diameter rope this giant is ready to close a single 80 ton length of it



ROEBLING "Blue Center" STEEL WIRE ROPE

WHAT CAN YOU EXPECT from Roebling? Rope that has known capacity to deliver service. Engineering, in our plant and at your job, to put the rope to work right. Maintenance practices that protect its long life. » » Your postwar profits and postwar jobs will depend in part on operating rope-rigged equipment at lowest cost. You can leave that part to Roebling.

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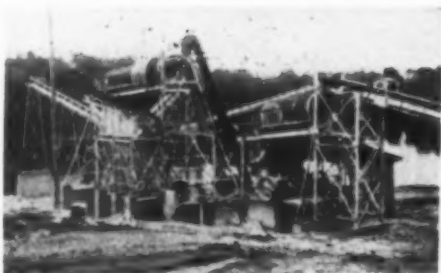


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Performance



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24 HOURS A DAY

7 DAYS A WEEK

ELECTRIC TAMPER & EQUIPMENT CO.

LUDINGTON, MICHIGAN

(Continued from page 154)

work on the Peace River Bridge and after Jan. 30 the remainder of the bridge crew was sent north for temporary assignment until arrival of the bridge timber. The timber superstructure was fabricated at a plant at North Vancouver, B. C. Scarcity of timber delayed deliveries to the fabricating plant until Nov. 9. Fabricating started in December and continued through January and February. Delivery at Dawson Creek started Feb. 25 and continued through May 14.

Work was resumed on Mar. 1 and from then to Mar. 18 workmen were engaged in setting dowels on piers 2 and 3 and in completing the travelers for the 190-ft. span. On Mar. 15 John B. Kiely, associate highway engineer, became resident engineer, relieving R. P. Agnew who had been resident engineer from the beginning of construction activities.

Timber erection began with the placing of the 12x12-in. sills for the east tower on Mar. 18. Because only a small crew was on the job at this time and workmen were delayed by a snowstorm, tower construction proper did not start until Mar. 20. The pieces of timber for the towers were lowered into position from the falsework deck with a gin pole equipped with manually operated winches. Erection of the west tower began on Mar. 30 and construction of both towers was continued on a one-shift basis until Apr. 3, when a night shift was added. Most of the erecting was done by the day shift. The night shift did the bracing and bolting. There were several snowstorms during this period and temperature reached 16 deg. below zero. Considerable additional work was necessary in removing snow and ice from bolt holes and grooves for ring connectors.

At this time it was necessary to prepare for the spring break-up. Most of the bridge crew were assigned to raising the deck of the temporary bridge about 5 ft. to provide clearance for the anticipated ice flow. Considerable work was also done in clearing a channel through the river ice. These additional activities resulted in a shortage of men in the crew on erection.

Spring Break-Up Begins

During the first part of April the weather turned warm and water began to flow over the river ice. This flow increased rapidly and during the night of Apr. 11 the water flowed over the dock of the detour bridge. A crew worked during the night pushing floating ice away from the falsework and preventing ice jams at the detour bridge. On Apr. 12 at 8 o'clock in the morning, very large blocks of ice floated down and carried

(Continued on page 158)

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 — U. S. Signal Corps Photo from Acme

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THE WELLMAN ENGINEERING COMPANY
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(Continued from page 156)

away the falsework and the detour bridge. After the loss of five bents of the falsework, the crest of the stream was 4 ft. above the tops of the concrete river piers, but no damage was done to the tower timbers.

Preparations were made to replace the temporary bridge with a pile-bent structure and piledriving began on Apr. 20. Driving piles into the frozen ground was difficult at first but progressed smoothly after a steam jet was used to thaw the ground and the piles were fitted with steel shoes. This work was carried on for 24 hr. a day as the crossing was needed not only for work at this site but also for movement of men, materials and supplies to points along the highway to the north. The temporary bridge was completed on May 1. While it was under construction, the two towers of the permanent bridge were completed and the east 114-ft. truss span was erected.

The next major operation was replacement of falsework for the main truss span. Piles for a low-level, pile-bent trestle were driven and framed bents were erected on them. This work was started on May 2 and finished on May 13. Erection of the 190-ft. main span over the river was begun on May 13. Two crews working 11 $\frac{1}{2}$ -hr. shifts completed this span and the adjacent truss span to the west and placed the floor beams by May 28. All truss members were erected with a traveler and block and tackle. Four members of the top chord of the 190-ft. span were 10×24 in. by 48 ft. in length. These were handled by four sets of tackle and one steel cable operated with a hand winch. The 6×16-in. timber stringers were installed on the east and west approach spans during the erection of the 190-ft. truss span.

Creosoted Timber Piling

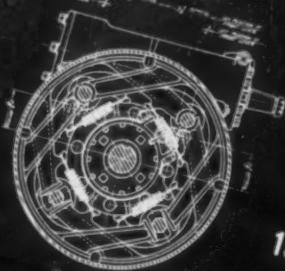
Each end bent consisted of five piles driven with a double-acting steam hammer mounted in stationary leads. The piles of the east end bent were driven during the period May 14 to May 16. These piles were driven to practical refusal with a penetration of about 20 ft. Piles for the west bent were driven between May 19 and 22. Resistance to penetration at this end was great, and all piles were driven to refusal with a penetration of only about 9 ft.

The flooring consisted of laminated 2×6-in. native spruce which had been given a bath treatment of water-borne salt preservative at the bridge site. Three wooden vats were constructed and used for dipping the lumber. A net retention of $\frac{1}{4}$ lb. per cu. ft. was desired and one part of preservative powder was mixed

(Continued on page 160)

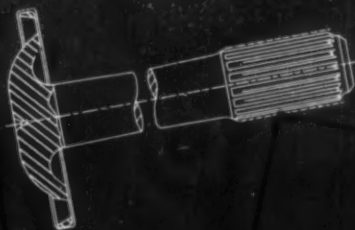
Thirty Eight Years AXLE ENGINEERING *Leadership!*

Duplex brake



1916

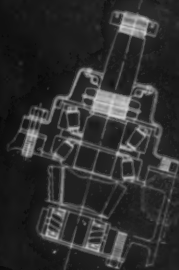
16 spline axle shaft



1934

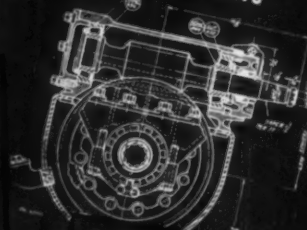
3 bearing pinion mounting

1921



Timken worm drive

1912



Tandem axle parallelogram suspension

1929



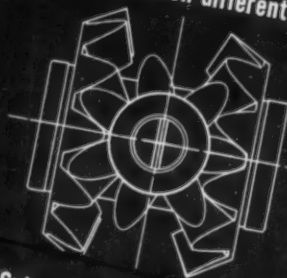
Front mounted double reduction drive

1923



High traction differential

1925



"P" power brake—with tapered liners

1939



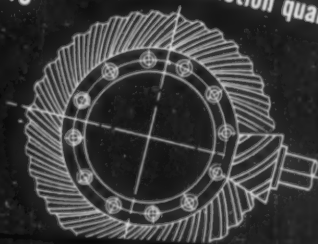
Straddle pinion bearing mounting

1905



Spiral bevel gear in production quantity

1913



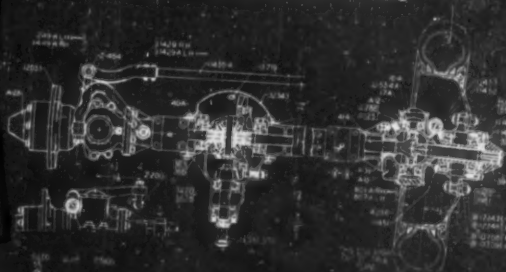
Pressed steel banjo axle housing

1909



Front driving axle—shaft drive

1930



"DP" brake

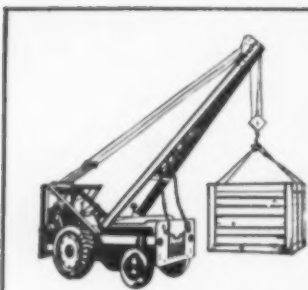
1943



TIMKEN AXLES

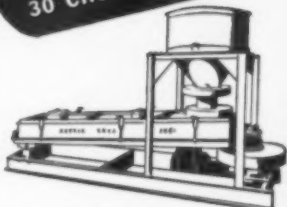
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Materials HANDLING Equipment



Materials PROCESSING Equipment

(Continued from page 158)

with 3.4 parts of water using one-barrel (300 lb.) batches. Frequent check tests were made to determine the amount of preservative retained. The lumber, thus treated, was stacked in piles and kept covered with tarpaulins for two to three weeks before use. Tests made on a few samples with color reagents indicated that the preservative had penetrated the full depth of the 2×6-in. lumber. Laying of the laminated flooring was completed on May 31. The 2×12-in. plank wearing surface was laid after the 12×14-in. timber felloe guard was placed, conforming to the curvature of the roadway.

Excavation for the job totaled 1,600 cu. yd. Used in construction were 780 cu. yd. of class B concrete, 11,334 lb. of reinforcing steel, 336 M. ft. b. m. of treated fir timber, 23 M. ft. b. m. of untreated fir timber, 120 M. ft. b. m. of treated spruce timber, 26 M. ft. b. m. of untreated spruce timber, 146 lin. ft. of treated timber piling, 87,400 lb. of bolts and connectors, and 90,400 lb. of gusset and bearing plates.

★ ★ ★

Britain's Airfields

(Continued from page 63)

are much shorter in length. The vast majority of the runways are paved with concrete 9 to 12 in. thick and are from 50 to 100 yd. wide. The change from grass to concrete strips presented a wartime project comparable to rebuilding the main roads of all England.

Around the three runways is a perimeter or taxi track which averages about 5 mi. in length. Used for taxi-ing to prevent congestion on the landing strips, it is also constructed of concrete. Dispersal points for parking grounded aircraft, space for hangars and personal accommodations are a large item. They must be linked by strong, all-weather strips. Sometimes the great network of a single airdrome overruns two or three villages. Altogether, the pavement on a typical field totals from 40 to 50 mi. of 20-ft. wide slab and, in terms of cubic yards of concrete, from 120,000 to 150,000.

Recently British forces have been engaged in construction of an emergency landing strip intended solely for the use of the occasional "lame ducks" that struggle home from Germany too badly shot up to reach their base. This project alone has been equivalent to building 40 mi. of main highway.

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output in dirt

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